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JOURNAL OF EDUCATIONAL RESEARCH

Official Organ of the Educational Research Association

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JOURNAL *of* EDUCATIONAL RESEARCH

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INTELLIGENCE AND SAFETY

MAX S. HENIG

Essex County Vocational School, Irvington, New Jersey

SINCE the appearance, in 1922, of Boyd Fisher's thought-provoking book, *The Mental Causes of Accidents*, the attention of the leaders in the movement for industrial safety has rightfully turned to the psychological aspects of the problem. No industrial establishment has, however, made a study of the relation between the intelligence of its employees and their liability to accident. This relationship is one which deserves investigation, for, to a regularly increasing degree, the important part played by the workers themselves is thrown into relief as the engineering and mechanical problems that enter into the prevention of accidents are brought closer to a satisfactory solution. The following is a brief account of just such an investigation. This study, made at the Essex County Vocational School in West Orange, New Jersey, was conducted to determine whether or not there exists any relationship between the intelligence of the school's apprentices and their liability to accident.

This school has for several years taught safety as a separate, but related, academic subject. Since the inception of the course, the intelligence of the boys enrolled in the school has twice been tested, each time by a different form of the Army Intelligence Test, Alpha. A two-year interval elapsed between the tests. Since pupils may enroll at any time, and the course requires an attendance of two years for graduation, about a score of boys took both tests. In spite of this fact, the test scores include one hundred and sixty-four cases. The following tabulation gives the number of boys whose scores fell into each intelligence group for both testings.

Intelligence Class	Number
A	6
B	28
C+	59
C	55
C−	14
D	2

When these records were compiled, many of the boys examined had either graduated or completed more than half of the prescribed course. It must, therefore, be remembered, in considering the following statistics, that the length of exposure to accident[1] was not the same for all the boys. Table I gives for each

TABLE I

PROPORTION OF ACCIDENTS IN EACH CLASS OF INTELLIGENCE

Intelligence Class	Number	Number Injured	Percent Injured
(1)	(2)	(3)	(4)
A	6	2	33
B	28	9	32
C+	59	30	51
C	55	35	64
C−	14	10	71
D	2	2	100
Total	164	88	54

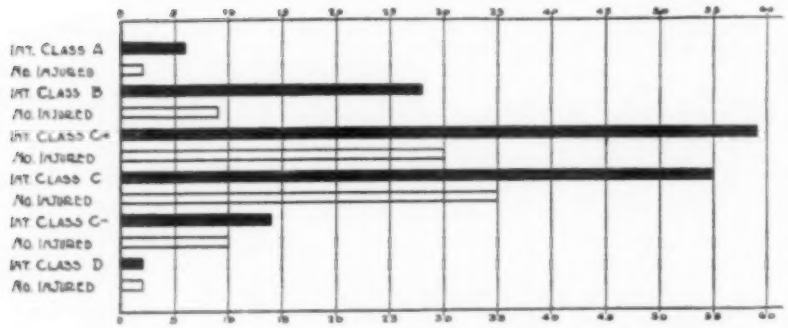

Figure 1. Comparison between the number in the various intelligence classes and the number injured in each class—length of time in attendance at school is disregarded

[1] The definition adopted by the school of a reportable accident is as follows: Every mishap that results in an injury which requires treatment is a reportable accident. Every injury that presents the possibility of infection must receive treatment.

intelligence class, the number who were injured and the percentage relation which this number bears to the total number of apprentices in each respective class. The same facts are indicated graphically in Figure 1.

TABLE II

PERCENT INJURED IN EACH CLASS OF INTELLIGENCE (ALL BOYS CONSIDERED GRADUATED FROM THE TWO-YEAR COURSE)

Intelligence Class	Number	Number Injured	Percent Injured
(1)	(2)	(3)	(4)
A	4	2	50
B	12	4	33
C+	27	17	63
C	26	22	85
C−	3	3	100
D	1	1	100

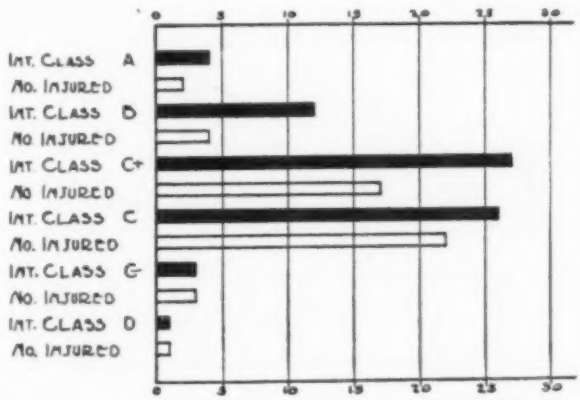

Figure 2. Comparison between number in the various classes of intelligence and the number injured in each class—length of time in attendance at school is two years

The graph and the table both forcibly bring out the fact that the frequency of accidents increases both absolutely and relatively down the various intelligence levels. The number of cases considered, as is true of all statistics presented here, is too meager, perhaps, to permit sweeping conclusions. This fact is emphasized

by a consideration of the upper and lower extremes of the table, Classes A and D. The former includes only six individuals, two of whom suffered mishaps, and so gave that class the disproportionately high accident rate of 33 percent; the latter presents two boys, each of whom incurred an injury, which gives that class an accident rate of 100 percent. Disregarding these, further reference to the table reveals the steady relative increase in the accident frequency of Class C+ over Class B, and of Class C over the frequency of Class C+.

So far, the frequency of accidents, among all the boys of the school who took the intelligence tests, has been presented without regard to their length of exposure to the hazards of their course. The following tables with their corresponding graphs, make this

TABLE III

PERCENT INJURED IN EACH CLASS OF INTELLIGENCE (BOYS CONSIDERED HAD COMPLETED MORE THAN ONE YEAR'S INSTRUCTION BUT LESS THAN TWO)

Intelligence Class	Number	Number Injured	Percent Injured
(1)	(2)	(3)	(4)
A	2	.....	.....
B	11	2	18
C+	14	5	36
C	15	7	47
C−	4	3	75
D	1	1	100

analysis. For those who have completed the school's two-year course, Table II gives a comparison of the number in the various intelligence levels and the frequency of accident in each class. Similar information is given in Table III for those who had attended the school for more than a year; and in Table IV, for those who had attended for a year or less. A comparison between the number of boys in each intelligence class suffering two or more mishaps, and the number of boys in the respective classes, is given in Table V.

Figure 2 presents graphically the facts given in Table II. This table, which is of particular significance since it is the only one that can deal with a group of boys whose term of exposure to acci-

dents was the same for every member, that is, a full two-year period, brings out even more emphatically than did the preceding table, the correspondence between a low level of intelligence and liability to accident. Table IV, whose facts are presented graph-

TABLE IV

PERCENT OF BOYS INJURED IN EACH CLASS OF INTELLIGENCE (BOYS CONSIDERED HAD ONE YEAR'S EXPOSURE OR LESS)

Intelligence Class	Number	Number Injured	Percent Injured
(1)	(2)	(3)	(4)
A	.....	.....	.....
B	5	3	60
C+	18	8	44
C	14	6	43
C−	7	4	57
D	.....	.....	.....

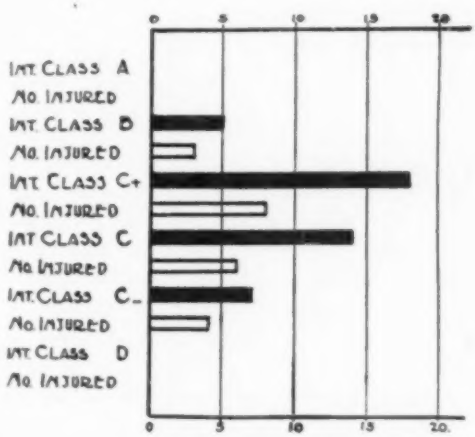

Figure 3. Comparison between the number in the various classes of intelligence and the number injured in each class—length of time in attendance at school was one year or less

ically by Figure 3, needs a word or two of explanation. It carries the information that it tabulates the accident experience of all boys the duration of whose stay in school is one school year or less; but

since boys are enrolled whenever a vacancy occurs, it follows that many of them, sixteen in fact, or 36 percent of the total number considered, attended school for less than a school year. This fact may account for the comparative flatness of the accident-frequency curve for this group, for the three classes, C+, C, and C—, which in all the preceding tables revealed the greatest frequency and variation, here show respectively eight, six, and four cases.

The keen analysis to which the causes of accidents and those who suffer from industrial mishaps are subjected, has revealed one further fact, namely, that there is a class of workers who have the accident habit; they are repeaters. Experience teaches them

TABLE V

PERCENT OF BOYS IN EACH INTELLIGENCE GROUP SUSTAINING TWO OR MORE INJURIES

Intelligence Class	Number	Number Injured Two or More Times	Percent Injured
(1)	(2)	(3)	(4)
A	6	2	33
B	28	3	11
C+	59	10	17
C	55	16	30
C−	14	5	36
D	2	2	100

nothing. They pass from one mishap to another. The school's experience with accidents has also demonstrated the presence of these repeaters. Table V shows the number, thirty-eight in all, of these accident-repeaters, some of whom appear in each of the levels of intelligence, and also reveals the striking fact that the lower the intelligence of the boy, the greater are his chances of repeatedly meeting with accidents. That these accident-repeaters may be a crucial element in the problem of the prevention of accidents in industry is implied by the knowledge that these thirty-eight boys sustained ninety-eight accidents of the entire one hundred and forty-six recorded, that is, 66 percent of the total.

The results of this investigation are summarized in the following conclusions:

1. A direct relation exists between intelligence as revealed by the Army Alpha tests and liability to accidents. The lower the apprentice's intelligence level, the greater is his liability to meet with accidents.
2. The lower the intelligence level of a boy, the more detailed should be the safety instruction given him and the closer and more constant the supervision.
3. Boys in intelligence Classes C— and D are so susceptible to accidents that for their own welfare, their acceptance as apprentices in a vocational industrial school is a questionable policy.

The facts revealed by this study have such genuinely weighty implications for the future advance of the movement for industrial safety that continued, similar investigation in industries is evidently advisable and even essential.

THE ABILITY AND EFFORT OF THE STATES TO SUPPORT EDUCATION

JOHN K. NORTON
Director of Research, National Education Association

THE data presented in this paper were procured by the Research Division of the National Education Association. The Division recently conducted a series of investigations which makes it possible to compare the forty-eight states as to ability and effort to support education in a more objective fashion than heretofore.[1]

By "ability to support education" is meant the amount of economic power behind each child to be educated. The amount of wealth and income possessed by a state, when properly weighted and combined in a single figure, provides an acceptable index of its economic power, and the Federal census gives the number of educables per state. A state with twice as much wealth—or tangible property—and yearly income per child as another state, is doubly able to support education, according to the definition.

How do the states compare as to ability to support education? The richest state of the forty-eight is 6.09 times as able to support its schools as the poorest. Considering the states in groups, the twelve richest have 3.22 times as much ability to support education as the twelve poorest states. Suppose that a property tax of ten mills would raise a given amount of school support per child in the richest state. Sixty-one mills would be required to raise the same amount per child in the poorest state. A personal income tax of 3 percent and of 18 percent would raise similar amounts for each child to be educated in the richest and poorest states respectively. In the twelve richest states, a tax of ten cents on each one hundred dollars of property will produce the same sum per child as a tax of thirty-two cents in the twelve poorest states, while an income tax of 3 and 10 percent, respectively, will produce similar sums per child.

[1] *See* the following publications for full data and interpretive discussion to support the statements made in this brief article: Norton, John K. *The Ability of the States to Support Education.* Washington, D. C., National Education Association, 1926. 88 pp. (Research Bulletin, Vol. 4, Nos. 1-2) "Major Issues in School Finance," *Research Bulletin of the National Education Association*, 5: 1-64, January, 1927.

The practical bearing of these facts upon the problem of obtaining school revenue is evident. In the poorer states the people have two alternatives. They must accept tax rates from three to six times as high as those in the richer states, or they must be content with school facilities costing from one-third to one-sixth as much as those provided by the more fortunate states.

Does the narrowness of the definition of ability to support schools omit significant factors which soften the effect of the preceding facts? Do peculiar conditions exist in the different states which require important modifications of conclusions one might base on these facts? Let us examine certain factors which bear upon the availability for the support of education of the economic power possessed by a state.

First, the states vary as to the distance they have advanced above the level of subsistence. The income per capita of some states is between three and four times that of others.[2] In considering the effect of this fact, let us think of two typical families which are alike in every way except that one has a yearly income of $1,000, and the other, of $4,000. The income of the second family is obviously much higher above the level of subsistence than that of the first family. The family with the smaller income will find it necessary to expend a much larger percent of its income for food, shelter, and clothing, and consequently, more difficult to allot a certain portion of that income to the education of its children. The same principle is valid in considering the aggregations of families composing a state. Greater effort, in terms of sacrifice and self-denial, is probably necessary for a poor than for a rich state in order to allot a given portion of its income to the support of the schools.

Second, the populations of the states differ significantly as to the ratio of adults to children. One state has .86 adults per child, under 21 years, another, 2.08. It has been suggested that doubling the number of children in a state reduces to one-fourth, rather than to one-half, its ability to support education.[3] Acceptance of this

[2] *See* Levin, M., and King, W. I. *Income in the Various States: Its Sources and Distribution, 1919, 1920, and 1921.* New York, National Bureau of Economic Research, 1925. pp. 43, 267.

[3] Clark, Harold F. "The Effect of Population upon Ability to Support Education," *Journal of Educational Research*, 14: 336-39, December, 1926.

principle increases the difference in ability to support education of the richest and the poorest state from a ratio of 6.09 to 1.00, to a ratio of 17.10 to 1.00. Less than 40 percent of the population of each of the five richest states is under twenty-one years of age, while more than 50 percent of the population of each of the five poorest states is under twenty-one.

A dollar will go further in some states than in others in providing an educational opportunity of a given type. Certain factors exist which influence the necessary expenditures. First among these is density of population. Other things being equal, equivalent school opportunities can be provided at a lower cost per pupil in a densely populated state than in a sparsely populated state. Seven of the twelve states most able to support education have a density of population three or more times as great as the average for the country as a whole. The next factor is the influence of variations in the cost of goods and services which are essential to school maintenance. Available data do not indicate that the cost of such items as school furniture, textbooks, and building material can be purchased more cheaply in the poor than in the rich states. School-supply houses usually quote one price for school supplies. The conclusion with reference to the most important item in school costs, expenditures for salaries, is less clear. Unskilled labor can probably be obtained at lower rates in the poor than in the rich states. Does the same principle hold with reference to securing the services of teachers? The purchasing power of an income is not the only factor affecting its drawing power. The attractiveness of a salary is also influenced by the position it occupies in the complete distribution of incomes enjoyed in the community. Since the typical income is considerably lower in the poor than in the rich states, a given salary will be relatively more attractive in the former than in the latter states.

This factor decreases in importance, however, as the contacts of a group widen. The contacts of teachers are becoming wider each year. The meetings of the National Education Association each year bring together thousands of teachers from every part of the nation. A summer-school attendance of 244,488 in teachers courses was reported for 1926. Many of these summer sessions bring together teachers from practically every state in the Union. They are becoming less provincial and are comparing their status

with that of the nation's teachers as a whole. The market for the services of teachers with good personality, ability, and training is widening, and such teachers each year choose from a wider field as to the type of community in which they will serve. This is particularly true of the leaders in the profession who probably exercise a prepotent influence in determining the quality of school facilities which a community is satisfied to accept. One might even raise the question whether it is not now necessary to pay higher salaries in communities where the standard of living is low, to obtain teachers and school executives of first rate ability.

It appears that, since the standard of living is significantly lower in the poorer than in the richer states, a dollar will probably go somewhat farther in securing teachers. If further study establishes this as a fact its influence would be in the direction of decreasing the differences between the rich and the poor states in ability to support education.

The preceding paragraphs list the principal factors, not taken account of in the given definition of "ability to support education," which will need evaluating before a perfect definition of this ability can be approached. Variation among the states in any of these factors, namely, distance above the level of subsistence, ratio of adults to children, density of population, and cost of goods and services essential to school maintenance, will affect their ability to support education.

Exact measurement of the influence of each of these factors is not essential in predicting whether its effect will be to increase or decrease the differences in the ability of the states to support education. The influence of two of the factors recognized will probably tend to increase such differences, one will have little or no influence, and one will decrease the differences. Considered as a whole, their effect is probably to increase the variations between the states.

The differences of the states' abilities to support education suggested in this paper are not exaggerated, therefore, because of the narrowness of the definition of ability. Rather, a proper interpretation of the data and factors involved indicates that the statement that the twelve richer states have from three to six times as much economic ability to support education as the twelve poorer states, is a conservative one.

Let us next compare the respective states' efforts to support education. The "effort of a state to support education" is defined as the portion of its economic power allotted for school maintenance.

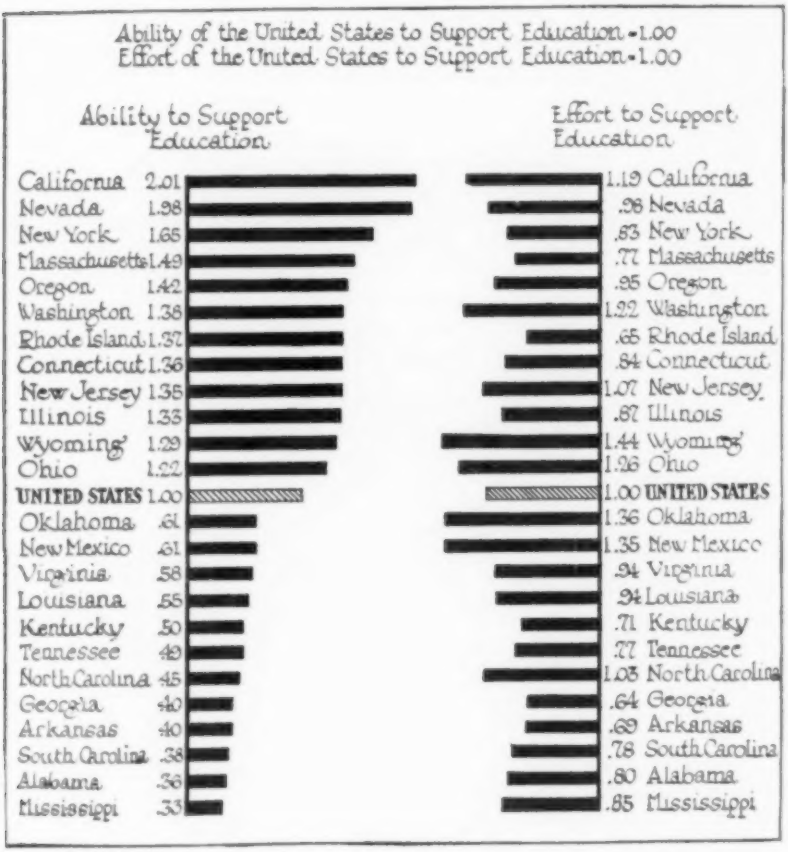

Figure 1. Comparison of twelve rich and twelve poor states as to ability and effort to support education

When the ratio of a state's total school expenditures to its wealth and its income is doubled, its effort to support education doubles according to the definition. The comparisons of ability and effort of twenty-four states to support education are shown in Figure 1. According to this figure, California has 2.01 times as much wealth

and income per child. California makes 1.19 times as much effort to support education as the United States as a whole. California has 6.09 (2.01 divided by .33) times the ability of Mississippi to support education. California makes 1.40 (1.19 divided by .85) as much effort to support education as Mississippi. Data for the other states can be similarly read and compared.[4]

Considering the two extremes, one state is making 2.91 times as much effort to support education as another. Taking the states in

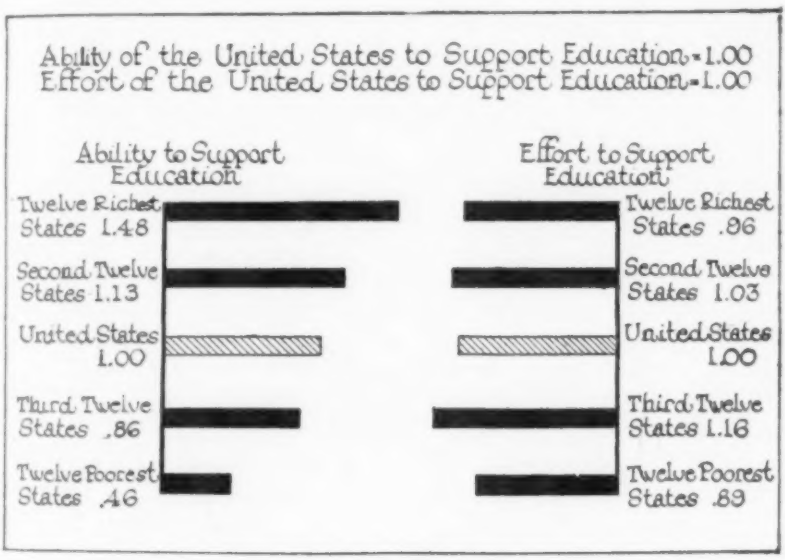
Ability of the United States to Support Education = 1.00
Effort of the United States to Support Education = 1.00
Ability to Support Education
Twelve Richest States 1.48
Second Twelve States 1.13
United States 1.00
Third Twelve States .86
Twelve Poorest States .46
Effort to Support Education
Twelve Richest States .86
Second Twelve States 1.03
United States 1.00
Third Twelve States 1.16
Twelve Poorest States .89

Figure 2. Comparison of the states in groups of twelve as to ability and effort to support education

groups, the twelve states making the greatest and the twelve states making the least effort compare as 2.10 to 1.00 in this characteristic. When these ratios are compared with those as to the differences in ability to support education, it is evident that the states differ much more in ability than in effort to support education.

Little correlation is apparent between ability and effort to support education. The richest state in the Union, which has 6.09 times

[4] This figure is based on the data given in the tables on pages 36 and 49 of Norton, *Ability of the States to Support Education*.

more ability to support education than the poorest, makes but 1.40 times as much effort to support education as the poorest state. Figure 2 gives a comparison of states in groups of twelve according to their ability to support education. Considering the states in groups of twelve, the twelve richest states have 1.48 times as much ability to support schools as the United States as a whole, while the twelve poorest states have .46 as much ability to support schools as the United States as a whole. The twelve richest states make .96 as much effort to support education as the United States, the twelve poorest states .89 as much effort to support education as the United States as a whole. The twelve richest states have 3.22 times (1.48 divided by .46) as much ability to support education as the twelve poorest states. The twelve richest states make 1.08 times (.96 divided by .89) as much effort to support education as the twelve poorest states.[5]

But little relationship exists between the ability and effort of a state to support schools. Rich and poor states generally make approximately the same effort to support education. The relatively small variations in effort appear to be dependent upon other factors than difference in ability. Should further investigation confirm these hypotheses, the conclusion is inevitable that the schools in some states must be developed at a cost per pupil which is but a minor fraction of that available in other states.

Most school executives would probably agree that the quality of educational opportunity offered the children of a state correlates highly with the financial support available per child. If this is accepted, the conclusion is valid that the educational opportunity offered the children of some states is destined to continue to be, as at present, much inferior to that guaranteed in others.

Such a condition is not only contrary to the ideal of an equal opportunity for all, but more important, offers a real threat to our orderly development. We may expect different sections of the country to differ radically as to their degree of educational attainment. Education furnishes the tools of communication which are prime requisities to an escape from ignorant localism. The quality of schooling in a state either directly or indirectly contributes to

[5] This chart is based on data given in tables on pages 36 and 49 of Norton, *Ability of the States to Support Education.*

the creation of indispensable educational values without which progress is impossible. When the quality of school facilities differs as radically as it must differ so long as the money available per child in some states is but a minor fraction of that available in others, dangerous variations in the states in the general level of educational attainment are to be expected.

As long as the problems the states have to confront can be settled within the individual borders or as long as those which cannot be confined to state boundaries are not sufficiently acute to arouse sections to the point of conflict, we may rest easy. Who can guarantee these prerequisites to orderly and peaceful advance? Looking to the future not in terms of years, but in terms of decades, we have no promise that another issue equal in gravity to that which precipitated the Civil War may not arise. The peaceful solution of such issues is possible only by a nation whose various sections are within hailing distance of each other on the highroad of educational attainment and whose people agree sufficiently to stand on common ground in dealing with questions of national import.

Are these fears justified? Their justification must rest upon the validity of the principal hypothesis of this paper; that is, that under the present organization for the financial support of schools, the educational opportunity offered the children in some states is bound to be much inferior to that offered in other states.

Various escapes from this situation have been suggested. Some make a sharp distinction between a reasonable equivalence of financial support per child and an equivalence of opportunity for obtaining an education. It is maintained that economic conditions in the poorer states are such that a very different type of education is needed in the different sections and that all the education needed in the poorer sections can be furnished at a fraction of the expenditure required in the richer states.

Some fear that if schools in the poor states offer opportunities similar in quality and completeness to those of the rich states, the people of these states will be educated above the station they must occupy in life. The argument is not new. It is found in the literature of the period when the principle of equalizing educational opportunity on a local, and later a state-wide, basis was first advocated.

It is thought by some that the normal economic development of the poorer states will, within a reasonable period, lift such states from their present economic position. The available facts and competent economic opinion do not support this view.[6] Even were it true, there is no guarantee that differences equal to, or greater than, those now existing in their respective abilities to support education will not continue to exist.

Others contend that the only solution is the adoption of the principle of Federal aid, with the object of guaranteeing some acceptable minimum amount of financial support per school child. Enough has already been said on this by other speakers and writers to justify no further statement here.

Some have said that even the poorest states can, if they are willing to make enough sacrifice, provide an acceptable educational opportunity for all children. The possibility may exist. Whether it is practical to expect the relatively poor and correspondingly illiterate states to value education three or six times or even twice as highly as the rich and relatively well educated states do, is, however, another question.

SUMMARY

"Ability to support education" is the amount of wealth and income per child. Considering the extremes, the most favored state has approximately six times the ability to support education that the least favored has. The twelve richest states have approximately three times as much ability to support education as the twelve poorest. Estimates given of the magnitude of differences between the states' abilities to support education are conservative, since certain factors affecting ability to support education were not taken account of in the definition. If properly evaluated, they would probably tend to increase the differences given.

"Effort to support education" is the percent of a state's wealth and income which is allotted to school support. The twelve states making the least effort and the twelve making the most compare in the ratio of two to one in this characteristic. Rich and poor states generally make an equal effort to support education. The relatively small variations in effort to support education appear to

[6] *See* Levin and King, op. cit., p. 46.

be dependent upon other factors than differences in the ability to support education. The poorer states must accept tax rates from three to six times as high as those in the richer states or be content with school facilities costing from one-third to one-sixth as much per child as those provided in the richer states.

The facts presented as to ability and effort to support education suggest the hypothesis that under the present organization for the financial support of schools the educational opportunity offered the children of some states is bound to be much inferior to that offered children of other states. Various escapes from the effect of such a situation have been suggested. These are listed but not evaluated.

FACTORS CAUSING FAILURE IN TEACHING

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Colorado State Teachers College

OPINIONS differ widely as to what constitutes failure in teaching. Fifty years ago the teacher who could not cope successfully with his pupils in a physical encounter was a failure, and even now some people measure success by the degree of silence and inactivity maintained in the classroom. Parents are prone to declare the teacher a failure if their children do not get along well; some measure the success of a teacher by the social qualities she manifests; while others believe the teacher is successful if the majority of the children enjoy going to school. In recent years, educational leaders by measuring the progress of pupils have attempted to determine standards of success, but as yet these instruments are unsatisfactory.

In this article, the writer will arbitrarily set up the ability to hold a position as the standard of success. Under this standard the teacher who is discharged or who does not secure re-election fails. Such a standard is far from faultless, for teachers sometimes lose their positions because they are too progressive. Progress deserves commendation, but the writer believes that adjustments come when a desire for them is created. The teacher who does not create the desire is too far ahead of his community and is usually discharged.

Many persons are indirectly affected when the teacher fails. Colleagues, pupils, and patrons are involved. If the school administration does not have cooperation, policies are blocked or sidetracked. When a teacher is failing, the other teachers in the system must carry extra burdens. Poor discipline in one room usually leads to troubles in other rooms. If one teacher uses poor methods and fails to provide material which leads to the growth of the students, other teachers must necessarily work to overcome this deficiency. Since the influence of the teacher is the dominant

[1] The writer of this article is Assistant Director of Extension Service at Colorado State Teachers College. In this capacity he is directly responsible for recommending the graduates of the College. The following article is the result of his investigation concerning the success or failure of Colorado State Teachers College graduates.

TABLE I

RANK, FREQUENCY, AND PERCENTAGE DISTRIBUTION OF FACTORS CAUSING FAILURES IN TEACHING

Factor	Rank	Frequency of Mention	Percent of the Distribution
(1)	(2)	(3)	(4)
Poor discipline	1	17	42.5
Inability to cooperate	2	14	35.0
Gossip	3.5	11	27.5
Immorality, sexual	3.5	11	27.5
Lack of teaching skill	5	10	25.0
Disloyalty	6	9	22.5
Inability to get along with pupils	7.5	8	20.0
Unwise choice of social companions	7.5	8	20.0
No desire for professional growth	9	7	17.5
Irresponsibility	10.5	6	15.0
Critical of colleagues	10.5	6	15.0
Immediate departure from building at dismissal of pupils	14	5	12.5
Tardiness in reporting for duty	14	5	12.5
Laziness	14	5	12.5
Lack of school interest	14	5	12.5
No community interest	14	5	12.5
Undesirable social conduct	18	4	10.0
Insubordination	18	4	10.0
Familiarity with pupils of the opposite sex	18	4	10.0
Untidyness in schoolroom	23	3	7.5
Neglect of school duties	23	3	7.5
Desire to move yearly	23	3	7.5
Constant grumbling	23	3	7.5
Carelessness in work	23	3	7.5
Inability to mix well	23	3	7.5
Questionable personal habits	23	3	7.5
Snobbishness	30.5	2	5.0
Slouchiness	30.5	2	5.0
Not willing to perform extra duties	30.5	2	5.0
Lack of truthfulness	30.5	2	5.0
Ignorance of school law	30.5	2	5.0
Grouchiness	30.5	2	5.0
Failure to meet business obligations	30.5	2	5.0
Desire for constant amusement	30.5	2	5.0
Constant shop talk	40	1*	2.5
Desire for undeserved promotion	40	1	2.5
Destruction of school property	40	1	2.5
Discourtesy	40	1	2.5
Favoritism	40	1	2.5

*Those factors having a frequency of 1 in the distribution are probably chance mention.

TABLE I—*Continued*

Factor	Rank	Frequency of Mention	Percent of the Distribution
(1)	(2)	(3)	(4)
Jealousy	40	1	2.5
Lack of originality	40	1	2.5
Lack of self-control	40	1	2.5
Non-alertness	40	1	2.5
Participation in neighborhood quarrels	40	1	2.5
Poor health	40	1	2.5

factor in the social and intellectual environment of his class, it is a serious handicap for a group of thirty or more children to live for nine months with a teacher who is so poor that he is not asked to return for a second year. Finally, the whole community is financially involved when a teacher fails, for in a great majority of cases he receives his pay from public funds.

TRAITS WHICH CAUSE FAILURE IN TEACHING

Several investigators during the last twenty years have sought to determine the factors which cause the failures of teachers. Osburn, summarizing three studies based upon the pupils' estimates of teachers, states that ability to discipline ranks first in frequency as one of the desirable qualities of a teacher.[2] Littler in a study of failures among elementary-school teachers finds poor discipline the most frequent cause. Based upon the judgment of supervisors, he arranges the causes of failures in the following order:

Causes of Failures	Rank
Poor discipline	1
Weak personality	2
Lack of teaching skill	3
Lack of interest in teaching	4
Laziness	5
Failure to cooperate	6
Poor health	7

[2] Osburn, W. J. "The Personal Characteristics of the Teacher," *Educational Administration and Supervision*, 6:74-85, February, 1920.

[3] Littler, Sherman. "Causes of Failure among Elementary School Teachers," *School and Home Education*, 33:255-56, March, 1914.

Buellesfield, in a study of the causes which underlie the dismissal of teachers, sent questionnaires to three hundred school men in various parts of the United States. From the replies received from one hundred and twenty-five school systems, he ranked the causes as follows:

Causes of Dismissal	Rank
Weakness in discipline	1
Lacked judgment	2
Deficient in scholarship	3
Poor methods	4
Daily preparation insufficient	5
Lacked industry	6
Lacked sympathy	7
Too nervous	8
Deficient in social qualities	9
Unprofessional attitudes	10
Unattractive appearance	11
Poor health	12

During the last two years the writer has interviewed several hundred superintendents and the members of school boards who have come to Colorado State Teachers College in quest of teachers. A careful record was made of forty interviews in an attempt to discover the concrete causes which led to the dismissal of teachers. Table I gives in tabular form the analysis of those forty interviews. A careful study of this table gives the composite picture of the teacher who fails. He is a poor disciplinarian with no ability to cooperate. He freely contributes to school gossip, is often unwise in the choice of his associates, and in a few instances he is even immoral. He lacks teaching skill and cannot adapt himself to the situation. He has no desire to grow professionally, spends as little time at school as possible, leaves his classroom immediately at the dismissal of the pupils, and frequently reports for duty after the tardy bell has rung.

The facts mentioned as the causes of failure by these forty employers of teachers were classified under the various factors listed in Table I. A sampling of the actual reasons given for teachers' failures follows. These reasons were classified under the first eleven

[4] Buellesfield, Henry. "Causes of Failure among Teachers," *Educational Administration and Supervision*, 1:439-52, September, 1915.

factors in the table, that is, those mentioned by more than five of the persons interviewed.

1. Poor discipline:
   The pupils had quarrels in school.
   Study was impossible because of confusion.
   The children were disrespectful and impudent.
   Teacher spent too much time visiting when on hall duty and the children "raised Cain."
   She permitted a small group to gather around her desk while the others brewed mischief.
   This teacher wrote personal letters in school and allowed the pupils to do as they pleased.
   Her punishments were not just in proportion to the offense.
   She seemed to have no love for children. Everything "got on her nerves." The pupils delighted to annoy her.
   She lost her temper easily and the boys took turns in entertaining the room by making her angry.
   She tried to be a czar but the children were accustomed to democracy.
   She always acted tired. The children craved activity.
   She did not know how to distribute her assignments in order to keep everybody busy.
   She was so chummy with the older boys that she did not have the girls' respect.
   She was so loud herself that everyone else joined in.
   She was continually "nagging."
   She always told them what she would do "next time," but the occasion never came.

2. Inability to cooperate:
   She never agreed with any other faculty member.
   She was always asking for special favors such as the privilege of being excused early to catch a train.
   She did not think it was fair to ask a teacher to do hall duty.
   She did not see any sense in letting the children go out doors to play.
   Every report which she was asked to make was just "some more red tape."
   She was "not going to waste her time at a Parent-Teacher Association."
   When she was asked to work upon a committee she always remarked, "The Principal is trying to get out of some more work."
   All of our reconstruction of the curriculum was just another fad.
   She did not believe in any special subjects such as music or art. When I insisted that pupils be given regular music instruction she balked.
   She always came to teachers' meetings with her hat and gloves on.
   I never saw her at one of the school games or programs.
   She never made it a point to visit or know the parents.
   She read during teachers' meeting and then came around later and asked questions.
   She refused to work with other teachers.
   She objected to having her room used during a community program.

3. Gossip:
   She told patrons all about any school disturbance.
   She talked all of the time.
   She was always looking for failings and as soon as she found something below par she told everyone who would listen.
   Her remarks always reflected discredit upon the school system.

She made light of the ability of other teachers.
She unfairly criticized the administration.
She was altogether too outspoken in her likes or dislikes concerning both her pupils and her work.
She talked so much that I was never sure of her loyalty.

4. Immorality:
She attended vicious road-house dances.
She went riding with a different man every few days and usually came home about four o'clock in the morning.
She received continual attention from young men known to be immoral.
She entertained men in her room.
She had a key to the school and took her men friends to the teachers' rest room to entertain them.
She associated with women in the community whose reputations were scarlet.
Although a married man he continually kept company with other women.
She upheld and encouraged immorality by her conversation.

5. Lack of teaching skill:
She did not know her subject-matter.
Her assignments were not clear.
All parts of the content received the same emphasis.
She talked too much.
She gave her work like a phonograph.
She followed no plans.
The children did not understand her questions.
She had no ability to explain difficult subject-matter.
She had no system. Her desk and room were always in confusion.

6. Disloyalty:
He wanted my job and criticized everything I did.
He poisoned the teachers against me.
He publicly condemned my administration.
He left things undone to put me in an unfavorable light.
He furnished my enemies with information about the school which hurt me.
He encouraged the pupils to make disciplinary trouble.
He circulated rumors that I had resigned.
He asked other people to apply for my job.
She continually criticized me before the board.

7. Inability to adapt one self to the situation:
The job was not just what she wanted and she told everybody so.
She publicly pitied herself because she had to live in such a place.
She had received more money in her last job, and she could not get over it.
She called the community a "hick" town.
The building, room, and supplies were never adequate.
She could not like the pupils.
She always wanted different work from that assigned to her.

8. Unwise choice of social companions:
She played cards so many nights that her health suffered.
She associated with a group which spent more money than she could afford.
She could not keep up socially and prepare her school work.
Her afternoon clubs interfered with extra-curricular activities.
Her best friends were always criticizing the school.

9. No desire for professional growth:
Teachers' meetings bored her.
She made no use of the professional books or magazines in our library.

He had not been to summer school in twenty years.
She scoffed at extension classes.
She called educational psychology "all bunk."

10. Irresponsibility:
She agreed to chaperon a party and failed to appear.
He was slow in meeting business obligations.
She was frequently tardy.
He was careless in handling school funds.
She returned one day late after Christmas vacation.
She contracted more debts than her salary warranted.

11. Critical of colleagues:
She found fault with the work of every new teacher.
She made fun of the dress of other teachers.
She told pupils in other rooms that their teachers did not understand the subject-matter of their grades.
She disciplined the pupils from other rooms and came to my office to criticize their teachers.
She took it upon herself to keep all the teachers in a straight and narrow path.

THE CONTROL OF THE FACTORS OF FAILURE

Several pertinent facts may be drawn from this sampling of ascribed causes of failure. Many of the disciplinary difficulties could have been avoided. Visiting when upon hall duty, writing personal letters in school, getting chummy with pupils of the opposite sex, continually nagging and threatening, all are factors which any teacher can eliminate. Inability to cooperate seems to be a matter of attitude. Requesting special favors, resenting any additional assignment, reading during teachers' meetings, all indicate the wrong attitude upon the part of the teacher.

Gossip is not harmless. The situations listed indicate that the one who is gossiping is not a friend of the school. When disturbances and failures are the chief topic of conversation no good can result.

When school superintendents discuss immorality among teachers they mean sexual vice. Attendance at road-house dances, all-night automobile rides, entertainment of the opposite sex in private rooms, and association with people who are known to be immoral mean failure for teachers. These situations can be prevented. No teacher needs to be discharged for these causes unless he chooses to defy social custom.

Since teaching skill is dependent upon knowledge of the subject-matter and method, a skillful teacher must know how to ex-

plain difficult subject-matter. The questions asked must have a meaning to the child; and, since all material cannot receive the same emphasis in skillful teaching, the information imparted must be organized. These are abilities which a teacher can acquire.

From the summary of causes gathered in this study one may conclude that the teacher can largely control many of the situations which lead to failure. Choice of companions who interfere with one's efficiency can be avoided. Professional growth through extension courses, summer schools, and library readings are available to every teacher. Irresponsible actions can be replaced by dependable conduct, and no teacher is forced to criticize her colleagues. These facts show quite definitely that many of the causes which lead to failure can be controlled.

PRACTICAL HELPS IN TEACHING SPELLING: SUMMARY OF HELPFUL PRINCIPLES AND METHODS

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THE aim of this article is to present in convenient form for use the most helpful suggestions relating to the teaching of spelling, found in the literature examined. Much has been written on the subject and is found in various books on spelling, books on educational subjects, spellers, teachers' manuals, and magazine articles. It was considered worth while to search out, collect, and classify this material with a view of making it more easily accessible to those who are interested in teaching spelling.

Sixty books and magazine articles listed in the bibliography were critically examined for the purpose of reaching definite conclusions as to the principles and practices recommended or sanctioned by the best modern authorities or by a majority of authorities. The statements are made as definite and significant as it seems safe to make them in view of the evidence. When there is conflicting evidence, the authorities both for and against are referred to by number. In such cases the attempt has been made to evaluate the conflicting facts and to educe the proper conclusions. In all cases where there seems to be any serious disagreement with the statement as given, reference is made to the dissenting opinions. The black numbers following the statements, as well as the black numbers in parentheses found in the discussion, refer to authorities listed alphabetically by authors in the bibliography. The black numbers are sometimes separated by commas from plain numbers which indicate the pages referred to.

This study is similar to one made by Professor Ernest Horn, of the University of Iowa, and published in the *Eighteenth Yearbook of the National Society for the Study of Education*. More than half of the literature covered by this article, however, has been published since the date of Professor Horn's writing.

THE MATERIAL OF SPELLING

1. Spelling is concerned only with the writing vocabulary, although one legitimate function of the teaching of spelling may

be the enlargement of the vocabulary (**1**; **19**; **29**; **30**,123; **37**,175; **46**,60; **51**; **52**,4; **54**,3; **55**).

We need to spell only those words which we write. As indicated, this must not be taken to mean that the spelling period is not to be used for the purpose of enlarging the pupil's vocabulary, that is, of teaching definitions and uses.

2. A small number of common easy words, with their repetitions, form a large proportion of the word material used by anyone (**4**; **15**; **42**,75; **46**,63; **52**,5; **54**,4).

A study by Ayers (4,9) showed *the* to be the commonest word in the English language, for, on the average, it occurs once in every sixteen words used. The words, *and, of, to,* each constitutes 1 in every 30 words used; and *I,* 1 in 40. The five words just mentioned, with *a, in, at, you,* comprise 25 percent of the words used. The fifty commonest words constitute 50 percent of the words used; and the two hundred and seventy-eight commonest words, 75 percent.

Cook and O'Shea reached the following conclusion:

> The examination of a vast body of family correspondence collected from widely separated sources shows that less than a dozen words do one-fourth of our work in writing, that about fifty do half of it, and that less than eight hundred do nine-tenths of it (**15**,251).

3. The average eighth-grade boy or girl will probably have occasion to use from twenty-five hundred to four thousand words in written form (**11**; **30**,124; **33**; **43**; **53**,116; **54**,9).
4. The misspellings of any one person, with their repetitions, consist of comparatively few words (**34**).

A good standard dictionary of today contains more than four hundred thousand words, not counting plurals and other standard variations. Shakespeare's writings contain fifteen thousand words; Milton's, about eight thousand.

5. Spelling lists should be made up of words found to be of frequent written use in and out of school; these will usually be the words found in the written compositions of school and community environment (**11**; **26**,57; **27**; **30**,124; **34**; **35**; **52**,6; **54**,4; **57**; **60**).

The child's present needs are provided for by his learning to spell the words used by school children in their written composi-

tions. The school must also provide for his needs later as a developing individual by teaching him the words which in all probability he will need as an adult.

6. The words of common occurrence in written discourse over a wide area should be compiled in a spelling book, or list, for that part of the country.
7. The lists in spellers need to be supplemented by lists of local importance (**1**; **29**; **40**; **43**,99; **53**). See also Statement 33.

Suzzallo (**53**) would include in such supplementary material grade lists, class lists, and individual lists. He recommends that every individual list include: every doubtful spelling for later investigation and mastery; every word the spelling of which he has been told; and every word that is marked wrong in the written work returned to the child.

8. Many extensive studies of the written words used by children and adults have been made, and these form the basis for several excellent spellers. These studies are reported briefly in chapters IV and VI, respectively, of the Third and Fourth Yearbooks of the Department of Superintendence.

ANALYSIS OF SPELLING

9. "That person is a good speller who can (automatically) spell the ordinary words he needs to use in his letters and compositions, and who doubts the words he cannot spell and ascertains the correct spelling before writing" (**35**,355).
10. "A wise teacher recognizes that errors are due to different causes, and must be corrected by different methods" (**25**,45).

A simple and helpful classification of spelling errors is that given by Randall (45) as follows: Errors of Ignorance which include peculiar forms of word, careless teaching, lack of attention, transliteration, and defective sight and hearing; and Errors of Carelessness which comprise careless habits, fatigue caused by too much writing, poor pronunciation, divided attention, and similarity of sound to another word.

Gill (**54**,98) gives a classification and a percentage distribution of errors studied by him:

Types of Error	Percent of Errors
Omission of letters	36.6
Silent letters	28.
Sounded letters	8.6
Insertion of letters	33.4
Silent letters	29.9
Sounded letters	3.5
Confusion of vowels	11.7
Inversion	10.5
Other causes	7.8
Total	100.0

11. Spelling is an individual problem, and the needs of each person must be studied and provided for (**11**; **18**; **19**; **21**; **23**; **35**; **36**; **51**; **52**,6; **53**,110; **54**,104; **60**).

HOW WE LEARN TO SPELL

12. "The child learns to spell by seeing or hearing the letters of a given word, and by thinking, speaking, or writing them in the order in which they are seen or heard" (**50**,322; **52**,8).

Of the five mental processes named—seeing, hearing, thinking, speaking, and writing—two of impression and two of expression form the bases for four kinds of images: (1) the sound of the word, (2) the sight of the word, (3) the way it feels when spoken, and (4) the way it feels when written (**45**). These are the eye, ear, throat, and hand images, or the visual, auditory, speech-motor, and hand-motor images.

When one hears a word pronounced, he gets an auditory image of it. When he pronounces it himself, there is the speech-motor as well as the auditory image. Copying gives a visual and a hand-motor image. Reading and spelling aloud give visual, auditory, and speech-motor images. Reading, spelling aloud, and writing the word attentively make use of all four types (**45**,54).

13. People differ as to the effectiveness of the four types of learning (visual, auditory, hand-motor, and speech-motor) in application to spelling (**13**,16; **15**,98; **25**; **29**; **34**; **45**; **49**; **50**,347; **52**,9; **54**,39; **56**,84).

14. Appeal to the student through as many senses and types of imagery as possible; and, if a particular type of imagery is

found to be especially effective with a student, make special use of that type with him (**13**,17; **21**; **25**; **29**; **34**; **40**; **45**; **50**,347; **54**,31; **56**,84).

15. Bagley's law of habit formation presents in a nutshell the method of learning to spell: "The focalization of consciousness upon the process to be automatized, plus attentive repetition of this process, permitting no exceptions until automatism results" (**13**,18. Also, **19**; **37**,198; **38**; **43**,31; **44**,54; **46**,69; **49**; **56**,9).
16. The principal mental processes to be emphasized in teaching spelling are: careful observation of the form of the word, correct analysis into syllables and letters, vivid visual and auditory images of parts and wholes, the association of throat and hand-movements with visual and auditory images, and repetitions to secure correct recall (**9**; **20**; **49**; **52**,11; **54**,39).

GENERAL MANAGEMENT OF TEACHING

17. Spelling efficiency is, to a great degree, a matter of method of teaching, though "the methods which are suitable for a good speller are apparently also suitable for a poor speller" (**26**,64. Also, **18**; **26**,70; **30**; **50**,340; **52**; **54**,142; **56**,82; 57).
18. The matter of motivation or aim, on the purpose of the learner, is of tremendous importance in learning to spell; and supplying this motive will perhaps tax the ingenuity of the teacher more than all other features of teaching (**5**; **13**,10; **17**,157; **18**; **27**; **30**,141; **35**; **36**; **37**,198; **39**; **43**,126; **45**; **46**,77; **53**,12; **56**,82).
19. Supply a motive for learning to spell by creating situations as nearly as possible similar to those met out of school, where there is a genuine need for spelling correctly and where to do otherwise would bring embarrassment, cause a loss, or create a want (**52**,21). For further remarks concerning motivation, see Statement 49.
20. An average of from one to two new words daily in the first grade to about five in the eighth grade will be sufficient to include all the necessary words for the average child in the

elementary school (**11**; **13**,20; **23**; **27**; **30**,138; **39**; **43**,31; **53**,115).

21. Spelling periods of from ten to fifteen minutes are long enough, if they occur daily (**26**,59; **30**,138; **44**,83; **46**; **72**,117; **54**,80; **57**).

22. Spelling rules are of little or no value in learning to spell (For: **9**; **13**; **33**; **57**; against: **15**; **26**; **27**; **30**,140; **43**,12; **50**,344; **52**,22; **54**,75).

While this conclusion is not supported by all the authorities read, the weight of authority is decidedly against the use of rules. Horn says:

> In the light of the present evidence, one seems to be justified in recommending that the teaching of rules be abandoned until more conclusive evidence is presented to show that the time spent in teaching them is as productive of efficiency as the same amount of time spent in teaching the words directly (26,55).

23. Frequent and systematic reviews must be provided for (**13**,21; **21**; **26**,69; **29**; **30**,137; **36**; **46**,74; **50**,343; **51**; **52**,19; **54**,88).

24. Preliminary testing on assignments reveals to the pupil the words he needs to study, and to the teacher, the words that need special attention (See Statement 26. Also, **20**; **21**; **26**,60; **27**; **28**; **31**; **37**,199; **38**,135; **40**; **43**,132; **51**; **52**,16; **54**,115; **60**).

The number of writers who recommend this preliminary testing and the unanimity of opinion among authorities regarding its value seem to establish it. Suhrie and Koehler (**52**) recommend this practice for the upper grades but condemn it for the lower.

Pryor and Pittman distinguish four kinds of spelling tests: (1) preliminary, for determining which words need study; (2) teaching, to judge the progress that is being made; (3) review, to test retentiveness and to recall earlier impressions; (4) standard, for comparing achievement of children in different schools (**43**,25). Children are erratic in their spelling; the fact that a word is spelled correctly once does not preclude its being misspelled soon afterwards (**2**,98; **26**,63; **27**; **52**,13).

In recognition of this principle, Horn (**26**) recommends that a word be spelled correctly in three consecutive trials before it is regarded as known. In the schools of Winnetka, Illinois, it is required that a word missed in a preliminary test be spelled correctly in four semester reviews before it is considered known by the pupil (**57**).

26. It is important to prevent original errors in spelling (**15**,64; **32**; **46**,69; **56**,83), but probably this should not prevent preliminary testing in order to discover the words needing attention (See Statement 24. Also, for: **26**,61; **37**; against: **29**).
27. It is important that the meaning and use of words be taught, if not already known, in connection with the spelling, and that before the spelling itself (For: **1**; **18**; **23**; **25**; **37**,198; **40**; **51**; **52**,16; **53**,38; **54**,78; against: **26**,61). Horn (**26**) is the only writer found who does not agree with the second clause of this statement. He says that it is not necessary that the meaning and use be taught first if the words are properly graded.
28. Use should be made of standard tests to let the pupils know their progress, and their standing as compared with the average pupils of their ages or grades (**21**; **29**; **31**; **37**,198; **43**,134; **44**,85; **46**,78; **50**,343; **51**; **54**,130; **60**).

The learner's consciousness of his own improvement as a factor is emphasized by Pyle in these words:

> Knowledge of one's record is a material factor in progress. If the learner keeps a close and accurate record of his progress, it incites him to practice at the highest efficiency. Without a knowledge of the results, one usually practices on a level much below the maximum. Teachers should find accurate means of measuring the progress of pupils. The improvement from day to day and from month to month should be shown to the children. They should be taught to make and interpret learning curves (**44**).

29. Teaching consists of something more than testing; during the spelling period some constructive help should be given towards overcoming difficulties (**9**; **23**; **26**,60; **40**; **52**).
30. A knowledge of phonics seems to be of value in learning to spell and should be given consideration, particularly in the lower grades (for: **1**; **9**; **18**; **20**; **30**; **39**; **52**,17; **56**; against: **23**; **26**).

Authorities are not all agreed as to the value of a knowledge of phonics. All agree that pronunciation is of value in helping one to spell (see Statement 36). It can be of value only as the sound of the word suggests the letters. Even in case of irregularly spelled words, the sound often suggests the letters by arbitrary association, if not by the phonetic principle, unless the word is totally new. Most of the value to spelling of correct pronunciation is due to phonics.

PROCEDURE IN TEACHING

31. The proper steps in the presentation of new words seem to be about in the order named: developing meaning, teaching pronunciation, preliminary testing, attention to difficulties through strong focalization and development of accurate images, followed by individual study (**20**; **27**; **40**; **46**,69; **54**,79; **56**).

The order of the steps named is a matter concerning which there is some difference of opinion. The above statement summarizes the authorities referred to with as little conflict as possible.

32. It is necessary that pupils be taught how to study spelling, that is, how to learn to spell (**1**; **18**; **23**; **26**,70; **27**; **29**; **30**,126; **43**,16; **52**,23; **53**,81).

Horn (**27**) gives the procedure followed in the elementary school, at the University of Iowa. This consists of nine steps. His directions agree almost exactly with the instructions on "How to Learn to Spell a Word" given by Gates (**18**,80).

33. Each pupil should keep an individual list of the words he misspells in his written compositions and be required to learn to spell these words in addition to those of the regular class assignment (**7**; **13**,23; **27**; **34**; **40**; **43**,131; **46**,75; **51**; **52**,21).

34. Authorities differ as to the desirability of using devices to call the pupil's attention to parts of words likely to give difficulty. (For such devices: 9; 15,46; 33; 38,138; 39; 43,21; 52,18; 54; against: 18; 22; 26).

35. Pupils should be encouraged to discover their own spelling errors; those that they overlook should be indicated for

them, and they should be required to make the corrections themselves (**43**,131; **52**, 20 and 21).

The above statement is not intended to indicate that pupils should not exchange papers for checking errors in words dictated, or that pupils should not point out errors in written work to each other in cases where the writer has carefully re-read in order to discover his mistakes.

36. The importance of correct pronunciation as an aid to spelling is great; teachers and pupils should take care to pronounce words clearly and distinctly (**1**; **15**,37; **18**; **25**; **26**,65; **33**; **37**,196; **43**,15; **52**,17; **54**,78).
37. The value of drill in the processes concerned with making correct spelling automatic cannot be doubted; but it must be remembered that repetitions, to be effective, must be accompanied by attention (**13**,20; **18**; **19**; **23**; **26**,69; **30**,126; **37**; **38**,140; **40**; **44**,54; **49**; **50**,343; **52**,21; **54**; **56**).

The reader should recall, in this connection, Statement 15 on the law of habit formation and Statement 9 defining good spelling. The importance of drill in fixing and automatizing the necessary associations should at once be apparent. Five of Horn's (**26**) "Principles of Method in Teaching Spelling" emphasize directly the value of drill.

38. The time, beyond a few minutes, devoted to studying spelling is more effective when distributed with intervening periods than when it consists of a single period (**13**,21; **26**,69; **44**,43; **46**,73).
39. Authorities differ as to whether it is more effective to teach homonyms together or separately (**30**,133; **43**,20; **45**; **52**,16).
40. There is no general agreement as to the value of grouping words which are to be taught by similarity of sound, appearance, or meaning (**1**; **11**; **18**; **26**,61; **45**; **54**,19; **55**).
41. Vocalization of the syllables of a word is perhaps an aid in learning to spell it (**13**,17; **14**,170; **30**,135; **42**,18; **46**).
42. Words that are spelled correctly in lists may be misspelled when written in sentences; in other words, it is more difficult to spell words in sentences (**15**,81; **24**; **28**; **39**; **50**,345; **56**,66).

43. Abundant use of words in sentences should be provided for, especially by way of review or drill (**13**,15; **15**,93; **29**; **39**; **46**,75; **52**,19 and 22; **54**,78).

44. Writing is a distinct aid in learning to spell in the upper grades; but it is impossible to say definitely with what grade writing as an aid to memorization should begin (**14**,168; **26**,68; **39**; **43**; **52**,17).

Much has already been said in regard to the value of writing the word as an aid in learning to spell it (see Statements 13 and 14).

45. Syllabication of the word is an aid in learning to spell (For: **15**,45; **18**; **21**; **22**; **26**,66; **39**; **43**,14; **52**,17; **54**,78; **56**; **59**; against: **47**).

There seems to be almost universal agreement among authorities in regard to this point. Rice is the only one who disagrees.

46. Neither the direct nor the indirect, or incidental, method is sufficient alone; both must be used (**7**; **13**,16; **23**; **26**,53; **58**).

47. "If we are to secure permanent improvement, we must seek to develop in each child a spelling consciousness, or ability to detect errors, and a spelling conscience which will not permit him to pass by a misspelled word." (Pryor and Pittman, **43**,131; also, **52**,24).

Tidyman (**54**) likewise says, "We have to distinguish between the knowledge of correct spelling (consciousness) and the desire to spell correctly (conscience)." In accordance with this distinction, Lull (**35**) recommends that pupils be instructed, in writing words from dictation, to indicate the words the spelling of which they are in doubt; and that, in scoring, they be allowed credit for the words they correctly doubt as well as for those they correctly spell; and that they should be charged with the words that they incorrectly doubt as well as with those that they misspell. (See Statement 9 in this connection.)

48. Ability to spell a root word does not give ability to spell even its simplest derivatives; therefore, "every common derivative form must be considered as presenting a new spelling problem and must be taught as such" (**3**,6).

49. A wide variety of devices should be used to awaken and maintain interest, to afford opportunity for the use of words, and to give drill in recall (see Statement 18 concerning motivation; also, **30**,134).

Several authorities listed in the bibliography give excellent devices for interest, use, and recall. Some that are especially good are numbers 5, 12, 39, and 45.[1]

RELATION OF SPELLING TO OTHER SUBJECTS

50. In order that spelling may function in all situations where it is needed, the teaching of spelling must be a cooperative enterprise on the part of all who are teaching the child, and a matter of deep concern in all his classes (**13**,15; **20**; **26**,64; **28**; **35**; **45**; **53**,18).

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[1] *See* also Courtis, S. A. *Teaching Spelling by Plays and Games.* Detroit, Michigan, The author, 1922. 80 pp.

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NEEDED RESEARCH IN THE FIELD OF MEASUREMENT IN SECONDARY EDUCATION

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IN a review of the principles and practices of measurement in secondary education,[1] a number of problems were uncovered whose solutions are important and pressing. These problems invite research, for they constitute the promising next steps in the development of tests and measurements in the high school. School administrators are anxiously awaiting the solution of some of these problems, while some of the others, though more theoretical, are just as important.

Research falls into ruts and becomes stereotyped, for there is a tendency to do what others are doing in research as well as in wearing fashionable clothes and going to Europe. Probably hundreds of correlations between the scores on intelligence tests and marks on examinations have been computed by high-school teachers since the war, yet a graduate student frequently will say to me: "The first thing I want to do on my job next year is to find the correlation between intelligence tests and school subjects in my school." This will undoubtedly be a piece of original and valuable research for this particular teacher, but we already know the general answer to this problem. Likewise, hundreds have used intelligence tests as predictors of academic success in college, yet I venture that this year scores of colleges will try them out for the first time and will go through the labor of convincing themselves of the value of the tests rather than to accept the now almost conclusive story that repeated research has yielded. This repetitive research is valuable. All educational research needs to be verified, and it is extremely helpful to have the same problem attacked at several centers. Anyone doing research, however, should first ascertain whether the problem has been attacked by others, and if so, he should consider his problem one of verification rather than original work. For one who wishes to do an original piece of research there are so many

[1] A book by the writer entitled *Measurement in Secondary Education* which is being published by Macmillan Company, New York.

unsolved problems awaiting solution that it seems a pity to overlook them in order to repeat something which already has been done over and over again. The problems listed in this article are unsolved except a few which need further verification. Most of them are important.

A. CHARACTERISTICS OF TESTS—

We need to know more about test forms and the general characteristics of test construction. Exceedingly helpful work has been done by Wood, Ruch, Toops, Paterson, Brinkley, Weidemann, and others in this field, but many questions are still unanswered. With respect to the true-false test we need to know—

1. The influence of the form of statement—its length, structure, use of negatives, etc.—on the validity and reliability of the whole test should be determined.
2. The form of the test in which the pupil responds to a statement as true, false, or neither true nor false needs to be studied for validity.
3. More data are needed concerning the comparative validities of the true-false test and the traditional essay examination. A more careful analysis of the questions of the essay type needs also to be made, for they vary in pattern just as new-type questions do. Some work on this problem has been done by Ruch, Brinkley, and Paterson.

Similar questions need to be answered for other types of objective tests.

4. Experimentation is needed on types of objective questions that may be constructed to measure other types of objectives besides memory or information. Best-answer questions of various kinds may be studied for both validity and reliability. As far as the measurement of achievement in any field of subject-matter is concerned, there is always the danger that increasing the text of a question may so increase the difficulty of reading that the question itself may be robbed of its validity.

There are also some practical questions regarding the use of standardized tests for measuring subject-matter.

5. Does a standardized test which fits no one text or no one course of study measure the results of a year's instruction as validly

and as reliably as a similar test having the same number of items and the same type of exercise which has been constructed exactly and comprehensively to fit a course as given?

6. How well does a single standardized achievement test measure the results of a course as compared with an exhaustive measure of the results of instruction in that course? Here the value of a limited test in a subject is questioned as a means of obtaining a comprehensive mark in that subject.
7. What is the influence of the guessing factor in multiple-choice tests given at the beginning of a course?
8. What is the validity and reliability of tests which represent the analysis of a problem? For instance, what is the comparative validity and reliability of a test of solving algebra problems and getting the answer when contrasted with two separate tests of formulating the equation and solving the equation?

B. NEW TESTS—

There are several subjects in the high school for which there are no standardized tests of any description, and there is also a need for diagnostic tests in almost every subject. Many of the standardized tests which are now on the market could be improved. The following is an incomplete list of some of the more outstanding needs:

9. Test of speed of reading for high-school students
10. Tests of reading for different purposes in the high school
11. Test in knowledge of English classics
12. Test in the history of English literature
13. Tests in the appreciation of English literature
14. A new standardized test in algebra, representing the most progressive tendencies in the teaching of algebra
15. A test in intuitive geometry:
    a. Test of knowledge of geometric forms
    b. Test of mensuration
    c. Test of ability to construct
16. A test of solid geometry
17. A test of trigonometry
18. A test of physics
19. A test of physiology
20. A test of Italian

21. A test of English history
22. A test of European history
23. A test of general history
24. A test of ancient history[2]
25. A test of economics
26. A test of problems of American democracy
27. A test of social problems
28. Various tests in athletic proficiency
29. Testing appreciation of music
30. Testing musical proficiency, both vocal and instrumental
31. Testing appreciation of pictures
32. A test of knowledge of the history and principles of art
33. A test of bookkeeping
34. A test of office practice
35. A test of the principles of salesmanship
36. Tests of knowledge and proficiency in various manual-arts courses

This list is necessarily incomplete, but it ought at least to awaken a sense of the possibilities and the needs. Every subject has its special phases which should be tested. A word of warning is in place here. Anyone who has in mind the construction of a new test should not enter upon the task lightly. There is room no longer for mediocre or poor tests. Unless one is willing to do the work necessary to make a good test, one should not attempt such a project. Before the elements can be assembled much preliminary work must be done in order to make sure that one is testing important features of the subject and that the test questions are random and representative. Once the test is assembled, it should be widely given for the purpose of determining the validity and difficulty of the elements. The alternate forms must be equated with care. After the test has been put in final form, it is not complete until norms have been supplied for several different times of the school year and until its reliability has been ascertained. Determining the reliability and ascertaining adequate norms are tasks that still need to be done for many of the existing tests.

[2] Sackett has made such a test, but it is not available.

37. Standards of passing, which are equivalent to scores on standardized tests, need to be determined.
38. Prognostic tests in all subjects

C. CHARACTERISTICS OF MENTAL GROWTH OF CHILDREN OF HIGH-SCHOOL AGE—

The determination of the mental characteristics of children of high-school age is an extremely difficult field of research and is fundamental to the establishment of truly scientific measurements in secondary education. Some of the problems are:

39. When does the growth of intelligence stop for the average youth?
40. Does a pupil's scores on intelligence tests continue to increase as long as he stays in school?
41. Is there any difference between the increases in the scores on intelligence tests of pupils who are in school and those of pupils who are not in school?
42. What are the age norms for unselected groups of pupils at all ages during the adolescent period?
43. What are the characteristics of the rate of growth at each age level?
44. What is the curve of growth of bright pupils?
45. What is the curve of growth of dull pupils who persist in school?
46. How regular is growth for individual pupils? Is there anything to the common belief that in adolescence there are periods of depression and at other times periods of rapid growth?

D. PROBLEMS RELATED TO PREDICTION—

As was already stated, many questions in prediction have been answered so many times that it is not necessary to do the same work again, especially since there are still many unsolved problems.

47. Does a set of test records accumulated over several years predict success better than the records of a single year or semester? How much better?
48. How much does prediction fall off with the passage of time? That is, does the prediction of success in high school which is based on elementary-school tests and records predict twelfth-grade work as well as it does seventh-grade work?

49. What is the effect on prediction of the variations which exist in the standards of marking between teachers or schools?
50. Is it true that school marks yield higher correlations than tests because school marks include certain factors of character which tests do not measure?
51. How valuable are character ratings in the prediction of success in public high schools?
52. What is the value of measures of the social and economic status of the home when combined with scholastic and intelligence records for predicting persistence in school?[3]
53. Is there more specialization in mathematics than in language?
54. What is the predictive value of a three-hour intelligence test as against a thirty-minute test?
55. Almost all work on prediction has been done in the academic curricula. There is great need for fundamental work to be done in other curricula, particularly those in commercial subjects, manual arts, and home economics. Devices for prediction in professional schools of the collegiate level are needed. It is probable that general intelligence tests will have to be modified before they serve as tests yielding the best prediction in these special schools.
56. The development of interest questionnaires. The work done on the Pressey X-O tests shows that they may be expected to yield valuable supplementary data to intelligence tests.
57. In connection with the practical matter of making predictive material available there is need for standardization of school marks and the development of a cumulative record card which will contain significant material.
58. The Iowa Placement Examinations show possibilities of objective subject-matter examinations for use in college entrance, and, indeed, wherever prediction is needed in the higher levels.
59. With the development of tests and the use of the correlation method a study should be made of the matter of prerequisites for courses.
60. The matter of point-requirements for college entrance should be investigated experimentally.

[3] In the Sims Score Card we have a valuable and reliable tool for measuring these social and economic factors.

E. USE OF TESTS IN TEACHING—

In this section problems are mentioned which are primarily concerned with teaching in which tests may play a part. Naturally only a fraction of the possible problems are included.

61. What is the possibility of using diagnostic tests in case of failures and requiring only those parts of the subject to be made up in which deficiencies are revealed by the tests?
62. What is the influence of new-type tests on the character of study? In particular, do the new-type tests make less demand on organization and synthesis in the study of a subject?
63. What is the educative value of the discussion of the items on new-type tests after the tests have been taken?
64. What is the value of daily or weekly quizzes against longer and more formal examinations at the end of a term or semester?
65. What is the consistency in validity and difficulty of test items when used in tests on several different occasions with successive classes?
66. Is it possible to organize high-school subjects for remedial work in science, mathematics, or the social studies, and to make use in a practical way of the information yielded by diagnostic tests?

F. PROBLEMS RELATING TO MARKS, PUPIL PLACEMENT, PROGRAM—

67. What is the effectiveness of the device of using intelligence tests to determine the selection of a group, as a basis for equating marks?
68. What is the effectiveness of the proposal that the teachers rank their pupils and that the marks be assigned by the office?
69. What are the factors that should be used in determining the pupil load?
70. What is the persistency of placement in ability sectioning?
71. Do dull pupils profit by the stimulus of the bright pupils, and to what extent?
72. Do bright pupils profit by the extra competition that comes from being in a heterogeneous group, and to what extent?
73. When placed in homogeneous sections do gifted pupils overwork, and to what extent?

74. How much do pupils learn from recitations as contrasted with pupils in classes where there are no recitations?
75. What are the effects of ability grouping on the progress of the pupils?
76. In what ways should bright and dull sections be treated differently in order to produce the most rapid advancement of both?

G. PROBLEMS RELATING TO THE MEASUREMENT OF EFFICIENCY—

77. What is the reliability of teachers' ratings of one another as compared with the ratings of supervisors?
78. What is the value of the rating of teachers by pupils on such points as "Which teacher do you like best?" "Which teacher makes you work the hardest?" "From which teacher do you learn the most?" "Which teacher has the best control over her classes and has the best order in her room?"
79. The construction of a professional test for teachers.
80. What is the relation of intelligence, preparation, and experience of teachers to their efficiency?

THE PERMANENCE OF IMPROVEMENT OF FIFTH-GRADE SCHOOL CHILDREN IN CERTAIN MENTAL FUNCTIONS[1]

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WHILE the improvability of school children is a decidedly fundamental question in education, permanence of improvement is equally important. Comparatively little experimental data have been gathered with reference to the retention of improvement of children under schoolroom conditions. Only through the frank reports of studies carried on by teachers who have the experimental attitude will there be made available a sufficiently large mass of specific material gathered under actual working conditions. With such an objective basis possible for educators to reformulate the laws of learning based hitherto upon data gathered under too limited conditions. This paper is a report of some measures of permanence in improvement made in connection with a larger learning experiment.

The subjects in this study were forty-nine children in a typical fifth grade in an American section of the city of New Haven, Connecticut. The average chronological age of the group was ten years. Forty-five complete practice records in seven tests were obtained over a period of eleven consecutive school days. The daily program of work with the total practice time of each test as administered in the order listed follows:

Test	Total Time per Test (Minutes)
Substitution (Symbol Digit)	44
Addition (Thorndike Sheets)	55
Reading (Chapman-Cook Speed Test)	16
Cancellation (Woodworth-Wells)	33
Multiplication (Arranged for this study)	55
Same-Opposite (Arranged for this study)	13
Multiplication by substitution (Sheets used by Thorndike and others, rearranged)	44
Total practice time	260

The usual care was given to the exact administration of the practice tests. The children were taught to consider the practice hour, from nine to ten each morning, as much a part of the day's

[1] The writer desires to express her obligations to the late Professor J. Crosby Chapman.

work as the assignment in arithmetic. There was no specific practice or discussion of the work by the teacher and children outside of the practice period. Motivation was chiefly brought in through class competition and through the posting of individual daily scores. After the practice series were completed no intimation of a follow-up test was given either teacher or pupils.

Four months after the practice series closed, the seven tests were again given on two successive days to determine the amount of improvement retained over the time of non-specific practice. Records were obtained from forty of the forty-five original subjects.

The tests were scored as in the practice series, and the scores of each individual on the two successive days of retesting were

TABLE I

AVERAGE AMOUNT OF RETENTION IS INDICATED BY THE DAY OF THE PRACTICE PERIOD WITH WHICH SCORE THE AVERAGED RETEST SCORES CORRESPOND

	Day 1	Day 2
(1)	(2)	(3)
Substitution	6	8
Addition	5	9
Reading	4	7
Cancellation	8	11+
Multiplication	11	11+
Same-Opposite	5	8
Multiplication by substitution	8	11+

tabulated. An idea of the efficiency level of the group may be gained from Table I where the average amount of retention in gross units is indicated by the days of the practice period with which the averaged retest scores correspond.

The table may be read in this way: the average score on the first day of the retest in substitution equalled the average achievement in this same test on the sixth day of the practice. The second day of the retest the efficiency level of the eighth day was reached. The state of efficiency in Multiplication on the first day of the retest is interesting when compared with that in Addition. The group had just finished multiplication of decimal fractions and were being drilled in speed work at the time of the retest. The function which suffered most from disuse was Reading. It was noted during the practice that memory was a strong factor in this test.

The percentage of improvement retained is shown in Table II. Improvement in the practice series was measured by subtracting the average score of the second day from that of the eleventh day in each test. The amount of improvement retained was measured by subtracting the average score of the second day in the practice test from the average score on each of the two days of retesting. A and B indicate the first and second days of retesting respectively.

TABLE II

PERCENT OF IMPROVEMENT RETAINED

	Substitution	Addition	Reading	Cancellation	Multiplication	Same-Opposites	Multiplication by Substitution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Average score—(Day 11)	145.5	17.2	27.5	186.6	127.2	35.9	35.8
Average score—(Day 2)	69.1	12.4	6.5	112.7	86.7	16.4	24.4
Improvement—(Day 11-Day 2)	76.4	4.8	21.0	73.9	40.5	19.5	11.4
Average on first day of retesting (A)	107.4	14.4	12.6	169.0	125.9	26.6	33.7
Average on second day of retesting (B)	134.9	16.1	18.4	195.4	133.4	31.3	37.0
Improvement retained (Day A-Day 2)	38.3	2.0	6.1	56.3	39.2	10.2	9.3
Improvement retained (Day B-Day 2)	65.8	3.7	11.9	82.7	46.7	14.9	12.6
$\frac{\text{Day A-Day 2}}{\text{Day 11-Day 2}}$	50	43	29	76	97	52	82
$\frac{\text{Day B-Day 2}}{\text{Day 11-Day 2}}$	86	77	57	112	115	76	110

In view of the relatively small amount of time spent in specific drill in the seven functions tested, the amount of improvement retained throughout four months of non-specific practice is decidedly significant. A comparatively small amount of practice—the two days of retests—brings the group to an efficiency level about equal to that at which they left off. This suggests not only the value of short drill periods on fundamentals in the classroom, but also the ease with which a group may recover its efficiency after a period of non-specific practice.

Another interesting problem was presented in connection with the permanence of a practiced function. Permanence is generally considered to be a factor in intelligence. The group was given the Illinois Examination I, Form 1, just before the practice series. This same form was again given at the close. For the sake of stability the averaged results of the two general intelligence examinations are used in Table III. The improvement and permanency of improvement of the ten highest intelligence quotients are compared with that of the ten lowest intelligence quotients in Table III. The measures of improvement and retention were obtained in the same manner as in Table II. The intelligence quotients of the superior

TABLE III

A Comparison of the Permanency of Improvement of the Ten Highest and the Ten Lowest Intelligence Quotients within a Group of Forty after Four Months of Non-Specific Practice

	Group X			Group Y		
	(Day 11-Day 2)	(Day A-Day 2)	(Day B-Day 2)	(Day 11-Day 2)	(Day A-Day 2)	(Day B-Day 2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Substitution.....	85.5	39.5	71.6	66.3	38.4	62.1
Addition.....	7.2	2.3	3.2	2.1	.4	1.9
Reading.....	25.5	7.1	13.9	18.1	5.1	9.8
Cancellation.....	73.8	65.2	86.7	78.3	63.8	84.0
Multiplication...	42.8	37.7	50.2	35.8	37.9	42.8
Same-Opposites..	21.6	11.7	17.3	17.5	9.5	13.0
Multiplication by substitution...	14.1	11.1	14.4	11.6	8.3	11.3

group (X) ranged from 135 to 148; those of the lower group (Y), from 73 to 112.

Table III indicates that, taking Substitution as an example, in Group X the ten subjects improved an average of 85.5 gross units during the practice. The first day of the retest they showed an average retention of improvement of 39.5; the second day, an average retention of 71.6 units. Group Y, on the other hand, originally scored 66.3 units of improvement in the same test and on the second day of the retest showed an average retention of 62.1. It is obvious that the gross units of measurement must be considered rather than percents, since the latter do not indicate the size of the improvements in the two intelligence groups.

This table suggests the value of drill for the lowest quarter as well as for the rest of the group. If the amount of improvement retained (Day A – Day 2 and Day B – Day 2) is expressed in terms of percent of the amount of original improvement (Day 11–Day 2), the lower group (Y) is on the whole quite on a par with the superior group (X). Group Y, however, in no case excels Group X in gross units of measurement except in the one test, cancellation. In other words, the retest scores indicate that Group Y regains its own former efficiency quite as rapidly as Group X. The intelligence test is frequently used by the teacher and administrator as an excuse for ignoring the poorer student. These results suggest that the possibilities with this lowest one-fourth are usually by no means exhausted. While the superior student is frequently a decided problem for motivation, the poorer student is doubtless capable of more than the usual achievement if he is given opportunity.

The general intelligence test gives within certain limits not only a fair indication of capacity for variability of response but also of relative capacity for improvement and for retention of improvement. This statement holds true for group averages just as in the case of all other generalizations concerning intelligence tests and learning curves. Accurate prediction in specific cases always requires a careful analysis of the individual's problems.

WILBUR

BERNICE LELAND
Detroit Teachers College

WILBUR displayed considerable bravado, strutting about the room at his full height and remarking cheerfully, "I can read good." A new brown suit anticipated his size some months hence and threatened to spill him out at any moment, for Wilbur was quite a little boy. Perhaps the newness gave him courage, for certainly rumor did not credit him with reading "good." He grasped the proferred book firmly in one stubby hand preparing to read from page thirteen of a certain primer. He began in the *lower right-hand corner* of the *right-hand* page, pointing out the lines from *right* to *left* with his left forefinger. The performance was like unto nothing we had witnessed before in the name of reading and without the pointing we might never have known where the start was made.

He proceeded glibly—"Run, run, come and, away, run to the tree, come come, play, play and come today!" And then he stopped for the obvious reason that he could think of nothing more to say. We asked him to place his finger on a certain word. He shuffled around in the new suit, rocked the chair on two legs, closed the book very slowly, and smiled wanly. The game is up!

He hadn't the slightest idea which word was "play" nor which was any other word we mentioned although he had been exposed to this beginning vocabulary for more than one semester. No formal test was needed to demonstrate his complete lack of reading vocabulary. His writing was equally weird. In Figure 1 some of his attempts are reproduced.

Wilbur was an intelligent child, his score on the Detroit First-Grade Intelligence Test placing him in the middle group, Y, when he was six years old. He attended school regularly and gave no trouble. He was generally liked; his clean, well-cared for appearance, his ready smile, and big brown eyes made a quick appeal. But he was an utter failure at his school work, which was, of course, mainly reading. His mother could not explain his performances, and no facts in his history seemed pertinent to the situation. She was loath, however, to accept the father's verdict that he was

"stubborn and could read if he would," and expressed her willingness to cooperate in any way.

In attempting to solve the riddle of his unusual performance, Wilbur became an object of increasing interest. He was unstable and erratic about things in general, and, although his desire to learn was earnest and most evident, he trailed off into nothing with

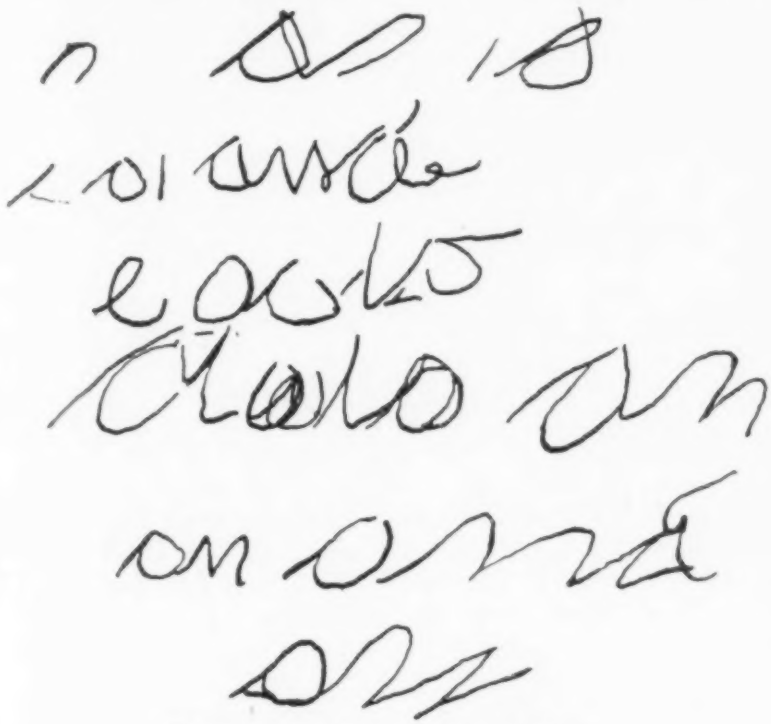

Figure 1. Samples of Wilbur's writings

many tasks just as he did in reading that first day. Random associations mixed things up generally. He often seemed bent on doing something or other, just anything. Being told that his name was to be written on the board, then asked what the word was, he replied, "My sister's name is Ruth." He persistently interpreted "Run, Wilbur" by trying to stand on his head, probably because in trying to make him understand what the game was he had been

told to do whatever the written command indicated even if it told him to stand on his head.

He did not know what was meant by a letter, a word, or a sentence, and his attitude of extreme dependence was a great hindrance. He never did anything through to a finish without repeated efforts to get help when it did not seem necessary. His attention was very easily distracted and dangerously "thin."

It is easy to discover that a child has no reading vocabulary, but quite another thing to determine why. It is easy to see that a child does not attend to a given object, but it is again quite another thing to determine the reason. This is of course an important matter, since attention is fundamental to learning. The difficulty may be congenital or it may be acquired. The two possibilities present entirely different situations to be met, it may be, in totally different ways.

One day, Wilbur was presented with a chevron pattern in color cubes such as are commonly used in the kindergarten. He was expected to copy this pattern, which was coarse and not intricate, and the task was new and altogether attractive so he went about it most happily. The clue to all of Wilbur's difficulty appeared with sudden emphasis in this situation. He was unable to do the copying because, after a few minutes of application, his eyes began to stream water. The eye specialist, to whom he was taken at once by his mother, found him to be very far-sighted and fitted him with glasses.

Corrected vision, however, could not give him a reading vocabulary on the spot, and now he must reconcile a host of new images with a tangled mass of past experiences with words. The record shows that this was accomplished with about thirty minutes of instruction daily, the period of disturbed imagery covering about four months. There was nothing "special" about the method used in teaching him, but the point that many readjustments must be made by a child in such a situation is a very important one. It takes time to do this. This fact should be recognized, and great patience shown during this period. No one can tell in how many guises any certain word may have appeared to vision so badly focused, and confusion is to be expected.

On March 8, about two months after the eye correction had been made, he was still apt to lose his place and to include in the sentence he was reading some rather distant portion of the page. In another month, however, losing the place was exceptional, and he had read sixty-five pages of the primer. In another two weeks, he had completed eighty-nine pages, his speed of recognition was noticeably greater, his expression good, and his pride in accomplishment was beautiful to look upon. Also, he had learned to work acceptably with a group.

"I read seventeen pages last night," he announced one morning, and without checking the accuracy of the statement we concluded that Wilbur was well started on the road to success in reading. He was promoted the following June and each semester thereafter, until now he has reached Grade V-B. Meanwhile, he has been transferred to another public school where his record in reading justifies our conclusions that poor vision was the cause of his difficulty.

EDITORIALS

THE ACCUMULATION OF MINUTE ADVANTAGES

TWENTY-FIVE or thirty years ago the master of the game of chess sought to win by spectacular methods. The gambit and the counter gambit were recognized tactics. The genius of Paul Morphy was still reverenced and the brilliant game was the game in which everything was staked in the execution of a grand coup. The modern game is different. The queen's gambit, the Evans, and the Muzio are no longer employed. Each player seeks from the beginning to develop his attack or defense, as the case may be, with every move. Accordingly, the game as it is played today has been characterized as a contest in the accumulation of minute advantages.

In education we are largely dominated by a certain out-and-out or black-or-white line of thinking. If the question is raised as to the value of supervised study we will have none of it unless it can produce large and incontestable superiority over other procedures. If we are thinking of the homogeneous grouping of pupils we demand an unequivocal advantage for it over heterogeneous grouping. The phonic method of teaching reading has displaced the alphabet method; but when one organizes a controlled comparison of the two methods, the proponents of the phonic method are disappointed that its victory is not more decisive.

It seems reasonable that the absence of pupils from school will decrease their attainments. However, when we compare the achievements of pupils who have been absent a not inconsiderable number of days with those who have been regularly present, the difference in scores is surprisingly small.

On *a priori* grounds we persuade ourselves that distributed drill in arithmetic is better than hit-or-miss drill, yet the measurable difference is not likely to be great. We are quite sure, likewise upon *a priori* grounds, that we can teach small classes better than we can large classes. We do; but the small class wins out in an objective experiment by the slenderest of margins.

So it is with many another rival procedure in education. The "whole" method of learning is in general better than the "part" method but only by a small amount. Learning with knowledge of results surpasses learning without knowledge of results, but the difference is not great. A "together" method of teaching addition and subtraction facts gets better results than a "separate" method of teaching them, but the victory is not impressive.

We are rather childish in our thinking about matters of this kind. We want a cure-all. We want a Dalton Plan or a platoon school or a junior college. And we want it to cure all our educational ailments. Some of the statistical techniques which the investigators have adopted have lent support to this naïve attitude. We demand that a difference between rival methods shall be a certain number of times its probable error before we say it deserves consideration. The difference must be one which would be found to exist, say, ninety-nine times in a hundred or we withhold from it the support of our distinguished consideration. We do this in utter disregard of the slender foundation upon which the whole probable-error technique rests.

Occasionally—as in the case of phonics in reading mentioned above—a method wins out not because it surpasses by 4 *PE* the method which it supplants but because common observation leads us to believe in its superiority. In a great many other instances, however, new and promising teaching or administrative procedures are failing to gain recognition because as against the "traditional" method or procedure they cannot muster the requisite number of *PE*'s.

The dream of a scientifically defensible teaching method will never be realized along such narrow lines. Such a method, if it is ever developed, will be made up of many elements, each of which performs its distinct function in establishing the final result. Lecture method, laboratory method, textbook method, individual instruction, and the admixture of either or all of these with a hundred other constituents may yet work together to produce the master method.

We are familiar in mathematics with the doctrine of the summation of infinitesimals. The result is a finite magnitude whose size may indeed be very great. Each method, which through patient in-

vestigation is proved to be a little superior to the methods hitherto in operation, is one of the small quantities entering into this summation. Let us not suppose that any one of these procedures must produce a large effect in the complex learning process. Let us be prepared to accept small gains and to combine them for the purpose of producing large gains. Let us work bit by bit toward the master method. Let us play the educational game as the chess masters are now playing their game. Let us be content with an accumulation of small advantages. B. R. B.

EDITOR'S NOTE.—A mistake has been found in the article by Dortha Williams Jensen in the March number of this magazine. In the third column of Table III the item opposite Los Angeles, "Modern Languages and Algebra, Drill Subjects," should read "Modern Languages and Algebra, Drill Subtracted." In copy-editing this article the author's abbreviation "Sub." was interpreted to mean "subjects" rather than "subtracted."

NEWS and COMMUNICATIONS

One million dollars has been given toward the endowment of the Lincoln School, Columbia University, by the General Education Board.

The National Research Council has issued a directory of research in child development which includes the names of 425 research workers. These are classified roughly according to the problems of research.

The Bureau of Educational Reference and Research, of the University of Michigan, has transmuted scores on various standard tests into Michigan grade-levels. Among the tests so treated are Thorndike-McCall Reading Scale, Woody-McCall Mixed Fundamentals, Stevenson's Problem Analysis Test, Wilson Language Error Test, and National Intelligence Tests.

Practice Exercise in Reading, Book 4, designed for improving the reading comprehension of pupils in the fourth, fifth, and sixth grades, has been prepared by Adele E. Mosseman, of the Los Angeles city schools, and published by the Research Service Company. The exercises, which are to be used in connection with *Journeys in Distant Lands* by Barrows and Parker, are of the completion-sentence type and are set up in such a manner that the child is to read a paragraph and answer a certain group of questions thereon before proceeding to the next paragraph.

Mr. L. H. Carris, manager of the National Committee for the Prevention of Blindness, states that careful studies by his organization indicate that in the United States one out of every twelve persons has defects of vision extensive enough to constitute an educational handicap and that one school child out of every five hundred has such seriously defective vision that he cannot with profit be instructed in the normal group. He states that there are now 264 sight-saving classes but that there should be at least 5,000. New York University, Columbia University, Peabody College, and the University of Cincinnati now offer courses for the special training of teachers for the sight-saving classes.

The State Superintendent of Public Instruction of California, William John Cooper, has announced the organization of a supervisory council which will work in cooperation with the Division of Research of the State Department. The personnel of the committee consists of Dean W. W. Kemp, of the School of Education, University of California; Dean E. P. Cubberley, of the School of Education, Stanford University; Dean Lester B. Rogers, of the School of

Education, University of Southern California; George C. Jensen, director of Research for the California Teachers Association; and Walter E. Morgan, assistant superintendent of Public Instruction in charge of the Division of Research and Statistics. The first project which this council will undertake will be the formulation of research problems of state-wide significance and the allocation of these problems to mature graduate students at the several universities as theses or dissertation problems for the higher degrees.

The Bureau of Educational Reference and Research of the University of Michigan, in a recent pamphlet (Bulletin, No. 102), reports the results achieved by a state-wide use of the Stevenson Problem Analysis Test given last October. The results show that in each of the grades except the fourth, the median scores obtained by the pupils in the cities is greater than the 1925 standards given by Dr. Stevenson. The standards obtained in Michigan for Grades IV and V agree very closely with those given by the author, while in Grades VI, VII, and VIII the achievement is about equivalent to three-months growth in each grade. The median of achievement made by the cities reporting in 1926 is greater than that made by those cities reporting in 1925.

A committee of the School of Education, University of Oklahoma, sent out a questionnaire to 88 universities and state colleges—not including normal schools and state teachers' colleges—in order to learn the type of organization under which these institutions operate. The summary of the 75 replies received shows that 24 have a four-year organization; 9 a two-year organization, entering students at the beginning of the junior year; 21 a department organization usually in the arts college and coordinate with such departments as English and history; 2 were graduate schools; and 19 had various other forms of organization not easily classifiable. Eleven of the four-year organizations are designated as "schools of education," 8 as "colleges of education." Seven of the two-year organizations are known as "schools" and 2 as "colleges."

A Committee of principals of state normal schools in Pennsylvania has recently issued a report on curricular revision. Specialists from the State Department in general charge of work in the various fields submitted to the committee their judgment of what the normal-school courses should contain. Normal-school teachers were also asked to present their points of view, and graduates of the normal schools were given an opportunity to answer a questionnaire concerning the subjects which in their judgment were most worth retaining and what might most profitably be added. From the evidence presented by these various individuals the committee has prepared a two-year curriculum for each of three groups: kindergarten and primary, intermediate grades, and rural schools. Four-year curricula were also organized for elementary- and junior high-school teachers. The report contains a brief description of courses in various fields with the semester-hours required in each curriculum. The report is worthy of perusal by all persons interested in the training of teachers.

EXPERIMENT IN STUDY AND LEARNING

A class of one hundred and fifty graduate students in educational psychology were given two weeks in which to devise and carry out some experiments which would throw light upon learning or upon methods of study. The following facts summarize some of their findings. Not all of the experiments were of the highest scientific grade, but in most cases the variables were controlled with care.

Whole and part learning.—Thirty-eight experiments were tried, in which twenty-one favored the whole and seventeen the part method of learning. The usual measure was speed of learning, seventeen reported an average of 28 percent less time for the whole method, while twelve reported an average of 25 percent less time for the part method. Six found better recall with the whole method, seven better recall with the part method.

Study: morning versus evening.—Eight experimenters found more favorable results in the morning; seven in the evening. Evening results were more significant because they were more carefully measured.

Taking notes.—Of twelve experiments on note-taking, four found the most favorable results without any notes, three by noting or outlining, two by taking few notes rather than many, and three by writing summaries after reading rather than taking notes during the reading.

Improving rate of work.—Three experimenters who practiced four, seven, and twelve days respectively found 33 percent, 33 percent, and 45 percent increases in their rate of reading. Practice in typewriting increased 10 percent when followed by rest, bringing an increase of 13 percent. Reading print at distance increases 42 percent with practice.

Influence of distractions.—Two experimenters obtained results as good as, or better than, studying alone, when they studied in the midst of music and conversation. Four others found decreases in efficiency of study ranging from 10 percent when listening to the radio to 50 percent when sitting out along a parkway.

Reciting while memorizing.—Seven experimenters found that the time given to trying to recall what has been learned increased efficiency from 20 percent to 700 percent.

Miscellaneous.—Supervision by the teacher was found helpful when children memorized. It proved desirable to put one's whole self into the learning. Words for use in writing were more easily learned in a list than in sentences. Interference arose on changing the orders in card-sorting. Memorizing words in regular order was found less desirable than shuffling the cards on which the words were given.

Three experimenters report that the distribution of time is more effective than learning at a single sitting; one found a 48-hour interval undesirable. Studying twenty minutes under pressure gave better results than forty minutes at ease. Children memorized better in class than when emotionally upset by having to do work after school or by threat of failure.

Skimming and scanning were found more effective than plodding. "Chord progressives" played upon the piano were found to aid memorizing. Memorizing by writing proved better than by reading.

A consecutive study period was found superior to alternating philosophy and poetry at three-minute intervals.

A curious physical fact reported was that after much sleep, memorizing was poorest, after little sleep, best. It proved better to look up words as they came, when translating, rather than to list and look them all up at once.

EFFORT RATINGS OF COLLEGE STUDENTS

As long as psychologists expected to find perfect correlation between intelligence and achievement in school subjects, they were naturally not so much concerned with the ratings of other factors. The intelligence-test score would be supposed to give a good measure of the actual accomplishment of the child and of the prognosis of his success. But, increased refinements of testing intelligence have not added materially to the original correlations, or at least the coefficients show no tendency of approaching unity. A new statistical measure was then drafted into service, and it became immediately popular. This was the Achievement Quotient or the Accomplishment Ratio. It was an index of how well the child measured up in his school work to what might be expected of him when judged by the position given him by an intelligence test. The degree of disparity between the two was supposed to be a rough measure of the amount of effort he was expending on his school work. Although Freeman has criticized the achievement quotient as a measure of effort put forth, on the ground that there are other factors, such as special abilities involved in the production of the measure, it is still a fairly satisfactory index of efficiency. If we use the achievement quotient in reference to the child's total scholastic achievement, and not with relation to one or two subjects, then the criticism would apparently not be so appropriate.

The necessity for some such measurement of efficiency in secondary and college education has led to various suggestions to overcome the defects of the achievement quotient when applied to these strata of achievement. We can no longer use the terms mental age, and educational age—which enter into the ratio known as the achievement quotient—because we cannot properly speak of such things in reference to more mature students following specialized lines of learning. Peters, in the JOURNAL OF EDUCATIONAL RESEARCH for September, 1926, has recommended the translation of the point averages of students and their intelligence-test scores into standard-deviation units or T-scores and the computation of the accomplishment quotient by dividing the former by the latter. This is probably a valid method for the derivation of such an index, although in extreme cases, a person unfamiliar with the statistics underlying it, might not be able to interpret it accurately. A difference of one standard-deviation unit in the lower limits of the scale would give a much different accomplishment ratio than would the same difference in the upper limits. Thus if a student had an intelligence T-score of 20 and a college achievement T-score

of 30, his achievement quotient would be 150. On the other hand, if another student had an intelligence T-score of 80 and an achievement T-score of 90, his achievement quotient would be only 113. Since standard deviations are supposed to mark off equivalent units of ability, we should have the right to expect that the achievement quotients of these two students should be the same.

Partly to overcome such a defect, although in actual practice it would probably not be a serious one, partly for the sake of simplicity, and to bring the index more in line with the already established system of giving college grades in letters, the suggestion is made that the use of letter ratings might be more convenient. The first step would be to find out the percent of scholastic grades given by the college faculty and divide the intelligence-test scores into the same number of grades with the same percent assigned to each.

TABLE I

EFFORT RATINGS OF THE PUPILS

Intelligence Test Grades	Scholastic Grades					
	A	B	C	D	E	F
A	A	P	V	W		
B	G	A	P	V	W	
C	X	G	A	P	V	W
D		X	G	A	P	V
E			X	G	A	P
F				X	G	A

TABLE II

DISTRIBUTION OF EFFORT RATINGS

Rating	Significance	Percentage
(1)	(2)	(3)
X	Very good, excellent	5.7
G	Good	19.0
A	Average	36.1
P	Poor	25.7
V	Very poor	9.5
W	Exceptionally poor	3.8

Thus in the present instance, it was found that the distribution of scholastic grades was as follows: A's, 2 percent; B's, 16 percent; C's, 36 percent; D's, 28 percent; E's, 13 percent; and F's, 6 percent. The intelligence-test scores were accordingly divided into six letter grades with the same respective percents. The effort ratings for the students were derived from Table I.

The distribution of effort ratings as found is given in Table II.

If a student showed himself capable of C work, judging from his intelligence-test score, but actually received a scholastic average of D, then his effort rating or achievement quotient would be P, or poor. If he received a scholastic rating of B, then his effort rating would be G, or good. A difference

of one scholastic grade in achievement means the same, and merits the same effort rating, whether the pupil is one of the "top-notchers" or one of the "tail-enders." This is as it should be, if scholastic grades mark off true equal units of difference. Theoretically, the more nearly they approach standard-deviation units, the more accurately do they do this.

The same criticism directed against the ordinary achievement quotient may with equal force be levelled against this rating of effort. The criticism may even be more appropriate in this case, since special ability is probably more important in college work than in elementary-school subjects. But, if we take the average of the grades of the student in all his subjects, then the effect of special ability will be pretty well discounted. In the present experiment, the average grade of the student was calculated from the number of credit points per unit-credit-hour that he was able to amass. This credit-point ratio was also important in indicating how efficiently he was approaching graduation, since the college requires that, in order to be graduated, the student earn 128 credit-points, or the same number of credit-points as credit-hours. In other words, his credit-point ratio must be 1 or above, or his average scholastic grade must be C or better, although D is ordinarily a passing grade.

TABLE III

RECORDS OF INDIVIDUAL STUDENTS

Name of Student	Intelligence—Test Grade	Scholastic Grade	Effort Rating	Credit—Point Ratio
(1)	(2)	(3)	(4)	(5)
John Smith	C	B	G	1.7
Tom Jones	D	E	P	0.08
Harry Brown	E	E	A	.....

If we should make use of the above devices, the records of individual students would be conveniently summarized in some such a fashion as is given in Table III.

John Smith would be a satisfactory student. Tom Jones is not working up to his ability and, according to present indications, will not be graduated. Harry Brown, although working with the expenditure of an average amount of effort, will not succeed at his present rate, and it is doubtful when we consider his native ability, if he can be graduated.

The validation of such ratings of effort would depend upon their normal distribution, since we may justly suppose that individuals may be classified, according to the amount of energy they expend, in the same fashion as when any other mental quality is under consideration. In order to give a normal distribution, the correlation coefficient between intelligence-test scores and scholastic grade should be somewhere around 0.5. The correlation coefficient in the present instance is probably a little too low.

W. D. COMMINS

St. Louis University

REVIEWS

GRUENBERG, BENJAMIN C. (Ed.) *Guidance of Childhood and Youth.* New York, Macmillan Company, 1926. xii + 324 pp.

The Child Study Association of America has supplemented its *Outlines of Child Study* by compiling a series of quotations on this subject from the writings of some three score contemporary authors. In each chapter, the editor's introduction on some aspect of child psychology is followed by three or more pertinent excerpts. A considerable degree of unity is maintained; also a fair measure of continuity, in spite of the fact that, though condensation is effected in some cases by omissions, actual quotations instead of abstracts are used.

The student in child psychology will find many familiar passages and in most cases will approve the selection of material, which is intended for "parents who really wish to understand." If he is teaching he will not find it an adequate textbook in child psychology. Even in recommending it to parents he will regret that more space has not been given to health education and to the school life of the child, both of which have important psychological aspects. The admirable section on the physical development and hygiene of the child, taken from Professor H. S. Jennings' *Suggestions of Modern Science Concerning Education*, could, for example, have been supplemented to advantage with some practical applied psychology on training in health habits, the relation of physical fitness to mental hygiene, etc.

The parent who "really wishes to understand" will find this symposium an inviting introduction to authors in the field of child psychology and should be stimulated to further reading. The teacher and social worker will find in this book a good review of what they should have learned in their courses in child psychology and attractive suggestions for bringing their professional reading up to date.

FRANCES N. MAXFIELD

Ohio State University

GRANRUD, JOHN. *The Organization and Objectives of State Teachers' Associations.* New York, Teachers College, Columbia University, 1926. ix + 71 pp. (Teachers College, Columbia University, Contributions to Education, No. 234)

This is a thorough study of the aims, accomplishments, and organizations of the state associations of teachers in all the states up to and including the year 1923-24. Knowing the rapid development in influence and the great increase in membership since that date, it is to be regretted that more recent years were not included in the study. The combined membership at that time was

436,392, and it is probably close to six hundred thousand at the present. In 1907, only 14.7 percent of the teachers of this country were members; in 1916, there were 34.1 percent; in 1923, there were 61.5 percent; and 75 percent is not far from a correct estimate for 1927.

It is stated that these associations reach about 60 percent of the membership through professional meetings and practically all of them through their journals. For this reason the results of this investigation are of vital interest to all who in any way influence the programs, policies, and practices of state associations and their publications. Many futile experiments and many needless blunders may be avoided by having access to the findings of this investigator. His recommendations regarding plans of organization are based on acceptable results of study and experience and the suggestive program of activities is forward-looking, comprehensive, and constructive.

F. E. REYNOLDS

Ohio State Teachers Association

BLANKENSHIP, ALBERT S. *The Accessibility of Rural Schoolhouses in Texas.* New York, Teachers College, Columbia University, 1926. vi + 62 pp. (Teachers College, Columbia University, Contributions to Education, No. 229)

It has long been assumed that schoolhouses are accessible to all rural children except the few residing in remote areas. Dr. Blankenship establishes the error of the assumption so far as Texas is concerned and questions its correctness as to other states. A great amount of inaccessibility exists not only in the sparsely populated counties of West Texas but in those having a population density in excess of forty-five per square mile. The condition is not limited to the remote areas of a given county but commonly prevails in territory contiguous to villages and towns. Some evidence is cited to prove that the inaccessibility is increasing and not diminishing.

Accessibility of a schoolhouse is determined by applying a bias square having diagonals of three miles and an area of four and one-half square miles to a school site so that the perimeter is equidistant at all points and the diagonals are parallel to the prevailing direction of the roads. As the rectangular nature of the original surveys determined the prevailing direction of roads, establishing the right-angle turn, the perimeter of the bias square is more nearly the locus of all points equidistant by road from the schoolhouse than the circle or any other figure that might be used. When applied to the school sites of a county it provides a graphic representation of inaccessibility and overlapping of districts. The measure is well conceived, valid, and practical. Administrators making use of it may vary the distance to meet different situations.

The conclusions are derived from the application of the measure of accessibility to 1,142 school sites in twenty-eight representative counties (without transportation) well distributed according to varying densities of population and from the location of 6,496 dwellings in four of the counties, each having a different level of population density. The four maps published are

typical. They reveal in varying degree the extent of inaccessibility in terms of area. The areas adjacent to villages and towns, where many children undoubtedly live, are noticeably inaccessible. A table shows nearly half of the children inaccessible to ten schools in one of the counties.

The data and the interpretations are valid but incomplete. The locations of the 6,496 dwellings are not found in the maps; the number and proportion of children within and without the accessibility areas are not presented except as above stated. Too much reliance is placed upon accessibility in terms of area and not enough in terms of children and school attendance, but enough valid evidence is presented to sustain the primary conclusion of a large amount of inaccessibility.

An illuminating discussion of state and local administrative policies lodges major responsibility for the unfavorable conditions upon well-intentioned, but mistaken, administrative policies. A remedial procedure is set up and clearly illustrated. The most significant suggestion merits comment. It is recommended that administrators take into account the difference in the walking ability of children of different ages. The application of the distinction requires the retention of the existing small schools for the young children, the establishment of others where necessary, the limiting of the work to the lower grades, and requiring the older pupils in the upper elementary- and high-school grades to attend central schools within a walking distance of three miles. This plan is well illustrated. Such a policy would greatly increase accessibility and provide a higher level of education for all children. Where transportation is practicable the areas of accessibility of the central schools would be extended to include many square miles of territory. Several centers might well serve an entire county. The plan is a modification of a complete consolidation, is educationally and economically sound, and is destined to be widely adopted by rural administrators. This study should stimulate many rural administrators to set up a measure of accessibility and apply it to the school systems intrusted to their care.

JOHN M. FOOTE

Louisiana State Department of Education

TOTAH, KHALIL A. *The Contribution of the Arabs to Education.* New York, Teachers College, Columbia University, 1926. v + 105 pp. (Teachers College, Columbia University, Contributions to Education, No. 231)

From a prefatory note, it is to be inferred that this book is a doctoral dissertation but the fact is nowhere stated. It is an account of education among the Arabs from the seventh to the fifteenth centuries, limits that we find specifically declared only when we reach the concluding chapter. This suggests the character of the treatment which proceeds as though the Arabs were a homogeneous people and as though what was true of one age or place was true generally. The book deals with the contribution of the Arabs to their own education and not with their contribution either to western culture or to civilization in general as the title might suggest. Indeed, educationally, the

mediaeval Arabs offer a study in similarity to the mediaeval Christians rather than in contrast with them. Both Arab and Christian education suffered from religious control and followed parallel developments that will some day make a useful study.

The book is prone to extraordinary judgments whenever it does try to show the influence upon the West. Judgments such as this one, "So it is the Arabs [of Baghdad in the ninth and tenth centuries] whom civilization should thank for ushering in the Renaissance" (p. 29), are characteristic. To receive acceptance such a dictum would require volumes, not a paragraph, and complete documentation, not merely assertion. The uncritical belief in statements of supposed fact is also common, although the author balks at the instance, found in one of his sources, of a student who is said to have studied under four thousand teachers.

The bibliography displays a complete lack of arrangement—even alphabetical—of discrimination between primary and secondary sources, and of the accuracy and completeness which should characterize such an instrument. It omits primary sources used and cited in the footnotes, Al-Maqqari, and also tertiary and antiquated titles like W. W. R. Ball and J. W. Draper. It omits first names and initials of authors and the dates and editions of works like the *Encyclopedia Britannica* that have been frequently revised. There is no index.

H. G. Good

Ohio State University

Crawford, Claude C. *Methods of Study.* Los Angeles, California, The Author, 1926. 163 pp.

In this small volume we find another contribution to the ever-growing list of texts on how to study.

The book aims, according to the Preface, to avoid the pitfall of abstractionism that seems to be the dominant characteristic of preceding texts on the same subject, and, instead of "being organized from the standpoint of principles and theories," is developed along the lines of "practice and activities," with the emphasis placed upon "the actual ways of doing definite school tasks."

There is no doubt but that the author hews to this line with grim determination. If there could be one general negative criticism of the entire book, it would be that the author has smothered the major issues of the subject under a blanket of advice, taking time and space to point out such things as the desirability of buying a notebook with three rings in it rather than one with two. In fact, the entire book is a tabulated list of "do's" and "don'ts" which, to say the least, are more individual in their application than the author seems to consider.

Practically every conceivable campus topic is touched upon: equipment of the student's room; how to get along with a roommate; attendance at classes; the technique of using the college library; attitude towards the professor; health; taking notes, both reading and class; manner of reciting; conduct in the laboratory; taking examinations; research and thinking.

From the practical side, probably the strongest section is that devoted to the taking of notes. We strike a more familiar ground, from the standpoint of generalized behavior, rather than specific conduct, in the brief section devoted to objectives. Even here, however, we find motivation reduced to the specific courses in the curriculum.

As far as make-up is concerned, many things are to be desired from the printer. There are a few too many typographical errors for a text. The table of contents lists blank pages for note-taking at the back of the book. These apparently have been overlooked. There is no index; but this may be accounted for by the fact that the entire book is little more than a topical index.

In brief, the author is to be commended upon his attempt to avoid a very obvious evil—the vague generalities that are usually found in such a text. However, the pendulum seems to have swung too far in the other direction, reducing the work to a classified list of recipes, which are to help the entering student in getting around, and "by," on a college campus.

S. L. CRAWLEY

Indiana University

HORRIDGE, FREDERICK. *The Problem of Apprenticeship in the Six Basic Building Trades.* Berkeley, California, University of California, 1926. 142 pp. (Trade and Industrial Series, No. 5, Bulletin No. 19)

This book contains a lot of common sense. It also contains some statistical technique such as the use of a regression equation to predict the number of journeymen workers required in a community of a given population. The educational implications are of two kinds. On the one hand the bearing of training for service in the building trades upon formal schooling is made evident. On the other hand the educational possibilities of the apprenticeship period are reviewed. The six building trades are those of brick and stone masons, carpenters, electricians, painters and glaziers, plasterers, and plumbers.

According to Dr. Horridge, our most competent workers in these trades are immigrants from continental Europe. Our apprenticeship system is grossly inadequate both in the excellence of the training acquired by the apprentices and in the number of journeymen turned out. Dr. Horridge recommends that the period of apprenticeship be either three or four years. This is considerably less than the traditional seven years and less than the European system requires.

It is maintained, no doubt justly, that these schools cannot adequately prepare individuals for these crafts. It is suggested that, instead of attempting to do so at a high cost per pupil, the teachers now employed in the vain hope of training carpenters or bricklayers should be transferred into the trades for the purpose of instructing apprentices even though the school must pay their salaries. Why not? The industries give evidence that this sort of training is ineffective. Even the theory work related to the trade apparently goes wide of the mark. One contractor says, "We send the boys to school to learn the theory work, but the school turns out 'bum architects.'" The algebra need

for a machine-shop foreman can be taught in four lessons yet the actual or prospective foreman must take eight or ten times as many lessons.

The significant relationships between the number of apprentices and immigration are discussed in this article for a strong inverse relationship is found to exist between the number who become apprentices and the number of skilled workers who come from abroad. The point is made that since the present immigration law went into effect the recruiting of the building trades has become well-nigh impossible. A plea is entered for a selective immigration law which will admit larger numbers of skilled workers.

Ohio State University B. R. BUCKINGHAM

KILPATRICK, WILLIAM HEARD. *Education for a Changing Civilization.* New York, Macmillan Company, 1926. 143 pp.

In these lectures Professor Kilpatrick has given us an account of the latest attitudes to which his educational thinking has led him. He has not departed from the faith which he shares with Professor Dewey. He finds that our changing civilization is especially in need of this gospel. We have lost our faith in authority; we accept only that "thought which is tested." We have gained extraordinary confidence in the powers of the individual to decide for himself, for in religion, morals, politics, economics, and education we must "be shown." The school that does not meet this situation, that does not convince the pupil of its worth, that does not prepare for life by work which constitutes a genuine sort of living, that is not democratic in appealing to and relying upon the child—that school must fail. The old coercive, autocratic instruction may have got results in the past, but now "trusting the child in the proper way is the only path in education." "Teaching must take the form of pupil activity in enterprises which they feel as their own."

Professor Kilpatrick's educational theory, like the changing civilization to which it is adapted, shows signs of growth. It is "leading on" to something which seems larger and finer and in which pragmatists, like Kilpatrick, find the criterion of genuine educational vitality. Static standards are abjured. Values as well as methods are experimental. Leading on may even consist in leading backward, for children must learn their social inheritance. They must learn not only to repeat and to understand it, but also get accustomed to using it. Again, Dr. Johnson's beatings by his schoolmaster are admitted to have worked in his case. Nowadays, Kilpatrick thinks, they are not needed. Discipline is important, but we manage so that it is "largely a disappearing problem." However, while we trust the child, we do it *in the proper way*, and each individual case must be treated as a particular problem.

That Professor Kilpatrick does not travel in a single track is proved by the fact that projects are mentioned only once in these lectures, and that the word does not even occur in the index. Truly, his philosophy of education is not untouched by the change that inspires it; it presents to us a liberal, a sane, and a stimulating excursion of thought.

ERNEST N. HENDERSON

Adelphi College

WEIDEMANN, CHARLES C. *How to Construct the True-False Examination.* New York, Teachers College, Columbia University, 1926. ix + 118 pp. (Teachers College, Columbia University, Contributions to Education, No. 225)

Part I of this monograph deals with such administrative features of the true-false test as the best form of instruction of the pupils, how and where to record the responses, whether pupils should be told to guess at doubtful items, the speed and accuracy of scoring, and the preparation of scoring keys. Prevailing practices on these points were ascertained through analysis of 175 examinations and standard tests, from which a total of 17,047 true-false items were gathered. The investigational procedures in the main depended upon the pooled judgments of five experts. Although it must be admitted that these five judges were chosen with unusual care, it is doubtful whether final recommendations should be based upon such findings; especially since certain issues treated through judgments could easily have been handled by controlled experimentation.

Part II deals with language considerations. It is based upon a search of handbooks of English composition for principles governing good language usage, punctuation, and spelling, together with an examination of actual true-false items for cases of violation of such rules. Forty-six such rules are mentioned specifically, most of these being principles which should be quite obvious to anyone in command of a working knowledge of the English language. Chapter VIII presents evidence that certain words like "always" and "never" act as *specific determiners*, that is, they tend to be more often false and hence act as cues to the pupil.

This volume contains a great deal of valuable information. Some of this will prove uninteresting to the reader because of too much detail. At times experimentation might well have been substituted for opinion. Some readers will feel that many of the larger issues in true-false examinations have been overlooked. Occasionally the treatment is marred by dogmatic statements like the one to the effect that a true-false item is always a declarative sentence—at least two well-known varieties of the true-false test employ interrogative forms. A few users of such tests feel that all such statements should be in question form to avoid fixation of error. Here again, an excellent experimental problem was overlooked.

G. M. RUCH

University of California

PUBLICATIONS RECEIVED, APRIL 15 TO JULY 15

BOOKS FOR EDUCATIONAL EXECUTIVES

Althaus, C. B. *The distribution of the tax burden of township and community high schools in Illinois.* Chicago, Illinois Agricultural Ass'n., 1927. 98 pp. $1.00.

Anderson, E. W. *The teacher's contract and other legal phases of teacher status.* New York, Teachers College, Columbia Univ., 1927. 180 pp. Contributions to education, no. 246) Cloth, $1.50. Paper, $1.25.

Baldwin, R. D. *Financing rural education; a critical study of provisions and practices in the several states.* Stevens Point, Wis., Rural Service Press, 1927. 210 pp. $1.80.

Bernays, E. L. *An outline of careers.* New York, Doran, 1927. 431 pp. $5.00.

Carnegie Foundation for the Advancement of Teaching. *Twenty-first annual report.* New York, The Foundation, 1926. 250 pp.

Charters, W. W., and others. *Basic material for a pharmaceutical curriculum.* New York, McGraw-Hill, 1927. 366 pp. $4.00.

Chase, Josephine. *New York at school.* New York, Public Education Ass'n., 1927. 268 pp. $1.50.

Cooley, E. J. *Probation and delinquency.* New York, Nelson & Sons, 1927. 544 pp. $3.00.

Cubberley, E. P. *State school administration; a textbook of principles.* Boston, Houghton Mifflin, 1927. 773 pp. $3.75.

Engelhardt, Fred, and Borgersrode, Fred von. *Accounting procedure for school systems.* New York, Teachers College, Columbia Univ., 1927. 130 pp. $1.50.

Ferriss, E. N. *Secondary education in country and village.* New York, Appleton, 1927. 401 pp. $2.00.

Flexner, Abraham. *Do Americans really value education?* Cambridge, Mass., Harvard Univ. Press, 1927. 49 pp. $1.00.

Foght, H. W., and others. *Comparative education; studies of the educational systems of six modern nations.* New York, Dutton, 1927. 500 pp. $3.50.

Gies, W. J. *Dental education in the United States and Canada.* New York, Carnegie Foundation for the Advancement of Teaching, 1926. 692 pp. (Bulletin no. 19)

Hamilton, O. T. *The courts and the curriculum.* New York, Teachers College, Columbia Univ., 1927. 168 pp. (Contributions to education, no. 250) Cloth, $1.50. Paper, $1.25.

Harap, Henry. *Economic life and the curriculum.* New York, Macmillan, 1927. 188 pp. $1.25.

Housman, I. E. *A digest and an explanation of the New Jersey teachers' pension and annuity fund law.* Hoboken, N. J., The Author, 1927. 144 pp. $1.00.

Houston, William. *The church at the university; her opportunities, obligations and methods.* Columbus, Ohio, Westminster Foundation of Ohio, 1926. 116 pp. $1.30.

Hypes, J. L. *Social participation in a rural New England town.* New York, Teachers College, Columbia Univ., 1927. 102 pp. (Contributions to education, no. 258) Cloth, $1.50. Paper, $1.25.

Knights, C. C. *The technique of salesmanship.* New York, Pitman, 1927. 249 pp. $1.50.

Koos, L. V. *The American secondary school.* Boston, Ginn, 1927. 755 pp. $2.80.

Learned, W. S. *The quality of the educational process in the United States and Europe.* New York, The Carnegie Foundation for the Advancement of Teaching, 1927. 133 pp. (Bulletin no. 20)

McMullen, L. B. *The service load in teacher training institutions of the United States.* New York, Teachers College, Columbia Univ., 1927. 97 pp. (Contributions to education, no. 244) Cloth, $1.50. Paper, $1.25.

Marraro, H. R. *Nationalism in Italian education.* New York, Italian Digest & News Service, 1927. 161 pp. $1.00.

Mort, P. R. *State support for public schools.* New York, Teachers College, Columbia Univ., 1926. 104 pp. $1.00.

National League of Nursing Education. Committee on Education. *A curriculum for schools of nursing.* 6th ed. rev. New York, The Author, 1927. 227 pp. $2.50.

Nichols, F. G. *A new conception of office practice based on an investigation of actual office requirements.* Cambridge, Mass., Harvard Univ. Press, 1927. 123 pp. (Harvard bulletin in education, no. 12) $.50.

O'Shea, M. V. *A state educational system at work.* Jackson, Miss., Bernard B. Jones Fund, 1927. 368 pp. $3.75.

Patty, W. W. *Legal basis of the public secondary education program of the United States.* Albany, N. Y., C. F. Williams & Son, 1927. 259 pp. $3.50.

Peppin, A. H. *Public schools and their music* New York, Oxford Univ. Press, 1927. 134 pp. $2.00.

Peterson, L. H. *California secondary school housing needs and available resources.* Berkeley, Calif., California Society for the Study of Secondary Education, 1927. 59 pp. $1.50.

Powers, J. O. *The junior high school; a study of instructional results in a typical city system.* Minneapolis, Minn., University of Minnesota Press, 1927. 112 pp. $1.75.

Reed, A. Y. *Human waste in education.* New York, Century, 1927. 449 pp. $2.50.

Shaw, F. L. *State school reports.* New York, Teachers College, Columbia Univ., 1926. 142 pp. (Contributions to education, no. 242) Cloth, $1.50. Paper, $1.25.

Spaulding, F. T. *The small junior high school; a study of its possibilities and limitations.* Cambridge, Mass., Harvard Univ. Press, 1927. 226 pp. $2.50.

Spence, R. B. *The improvement of college marking systems.* New York, Teachers College, Columbia Univ., 1927. 89 pp. (Contributions to education, no. 252) Cloth, $1.50. Paper, $1.25.

Stowe, A. M. *Modernizing the college.* New York, Knopf, 1926. 126 pp. $1.50.

Strayer, G. D., and Engelhardt, N. L. *School building problems.* New York, Teachers College, Columbia Univ., 1927. 697 pp. $6.00.

Streitz, Ruth. *Safety education in the elementary school.* New York, National Bureau of Casualty and Surety Underwriters, 1926. 142 pp. $1.10.

Stuart, Hugh. *The training of modern foreign language teachers for the secondary schools in the United States.* New York, Teachers College, Columbia Univ., 1927. 111 pp. (Contributions to education, no. 256) Cloth, $1.50. Paper, $1.25.

Troth, D. C. *History and development of common school legislation in Washington.* Seattle, Wash., Univ. of Washington Press, 1927. 257 pp. (Univ. of Washington publications in the social sciences. Vol. 3, no. 2) $1.50.

Williams, L. A., and Rice, G. A. *Principles of secondary education.* Boston, Ginn, 1927. 339 pp. $2.00.

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Bronner, A. F., and others. *A manual of individual mental tests and testing.* Boston, Little, Brown, 1927. 287 pp. $3.50.

Cameron, H. C. *The nervous child.* New York, Oxford Univ. Press, 1925. 233 pp. $1.75.

Goddard, H. H. *Two souls in one body?* New York, Dodd, Mead, 1927. 242 pp. $2.50.

LaRue, D. W. *Mental hygiene.* New York, Macmillan, 1927. 443 pp. $2.20.

Meyer, M. F. *Abnormal psychology; when the other one astonishes us.* Columbia, Mo., Lucas Bros., 1927. 278 pp. $2.50.

Walters, F. C. *A statistical study of certain aspects of the time factor in intelligence.* New York, Teachers College, Columbia Univ., 1927. 82 pp. (Contributions to education, no. 248) Cloth, $1.50. Paper, $1.25.

BOOKS FOR TEACHERS AND SUPERVISORS

Andersen, Leonora. *An athletic program for elementary schools; arranged according to seasons.* New York, Barnes, 1927. 134 pp. $2.00.

Berry, Elmer. *The philosophy of athletics.* New York, Barnes, 1927. 214 pp. $2.00.

Carpenter, M. F., and others. *Handbook of correct writing.* New York, Harcourt, Brace, 1927. 108 pp. $1.00.

Cook, H. F., and Walker, E. M. *Adult elementary education.* New York, Scribner, 1927. 407 pp. $1.80.

Fairbanks, H. W. *Real geography and its place in the schools.* San Francisco, Harr-Wagner Pub. Co., 1927. 198 pp. $2.00.

Freeland, G. E., and others. *Teaching in the intermediate grades.* Boston, Houghton Mifflin, 1927. 398 pp. $2.15.

Gist, A. S., and King, W. A. *The teaching and supervision of reading.* New York, Scribner, 1927. 337 pp. $1.80.

Harris, J. M., and others. *Supervision and teaching of reading.* Richmond, Va., Johnson Pub. Co., 1927. 474 pp. $2.00.

Hartland, E. S. *The science of fairy tales; an inquiry into fairy mythology.* New York, Stokes, n.d. 372 pp. $2.25.

Huber, M. B., and others. *Children's interests in poetry.* Chicago, Rand McNally, 1927. 233 pp. $1.75.

Humane education; a handbook on kindness to animals, their habits and usefulness. Arranged by H. C. Reynolds. Boston, American Humane Education Society, 1926. 172 pp. $1.00.

Kennedy, Marion, and Bemis, K. I. *Special day pageants for little people.* New York, Barnes, 1927. 48 pp. $1.50.

Lindeman, E. C. *The meaning of adult education.* New York, New Republic Inc., 1926. 222 pp. $1.00.

Masso, Gildo. *Education in utopias.* New York, Teachers College, Columbia Univ., 1927. 200 pp. (Contributions to education, no. 257) Cloth, $1.50. Paper, $1.25.

Monroe, W. S. *Directing learning in the high school.* Garden City, N. Y., Doubleday, Page, 1927. 577 pp. $2.50.

Morton, R. L. *Teaching arithmetic in the intermediate grades.* New York, Silver, Burdett, 1927. 354 pp. $2.16.

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Nolan, A. W. *The case method in the study of teaching with special reference to vocational agriculture.* Bloomington, Ill., Public School Pub. Co., 1927. 266 pp. (Educational research monographs, no. 10) $2.00.

Pringle, R. W. *Methods with adolescents.* Boston, Heath, 1927. 437 pp. $2.00.

Ruby, J. C., and Lipe, C. C. *How to coach and play basketball.* Champaign, Ill., Bailey & Himes, 1926. 268 pp. $3.75.

Sanford, Vera. *The history and significance of certain standard problems in algebra.* New York, Teachers College, Columbia Univ., 1927. 102 pp. (Contributions to education, no. 251) Cloth, $1.50. Paper, $1.25.

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Shreve, Francis. *Supervised study plan of teaching.* Richmond, Va., Johnson Pub. Co., 1927. 439 pp. $2.00.

Sumption, Dorothy. *Fundamental Danish gymnastics for women.* New York, Barnes, 1927. 189 pp. $2.00.

Touton, F. C., and others. *Studies of secondary school graduates in their mastery of certain fundamental processes.* Los Angeles, Calif., Univ. of Southern California, 1927. 56 pp. Cloth, $1.00. Paper, $.50.

Williams, J. F. *Hygiene and sanitation; the essentials of modern health care.* Philadelphia, Saunders, 1927. 344 pp. $2.00.

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About, Edmond. *Les jumeaux de l'hôtel Corneille.* Ed. by M. L. Ray and R. A. Bahret. Boston, Allyn & Bacon, 1927. 186 pp. $.80.

Altholz, Nathaniel, and Klein, A. W. *Modern bookkeeping practice; first-year course.* Chicago, Lyons & Carnahan, 1926. 366 pp. $1.60.

Atwood, W. H. *Biology.* Philadelphia, Blakiston, 1927. 522 pp. $1.68.

Beard, C. A., and Beard, M. R. *History of the United States.* New York, Macmillan, 1926. 677 pp. $.96.

Benét, W. R. *Poems for youth.* New York, Dutton, 1927. 512 pp. $3.00.

Berg, Edward, and Wing, B. E. *Essentials of metal working; a textbook for schools and shops.* Peoria, Ill., Manual Arts Press, 1927. 159 pp. $1.32.

Blackstone, Harriet. *New pieces that will take prizes in speaking contests.* New York, Noble & Noble, 1926. 408 pp. $2.00.

Bliss, W. B. *Your school and you; a textbook of guidance.* Boston, Allyn & Bacon, 1927. 248 pp. $1.20.

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Clark, C. U. *Italian lessons and readings.* Yonkers-on-Hudson, N. Y., World Bk. Co., 1927. 398 pp. $2.00.

Clark, J. R., and Otis, A. S. *Modern plane geometry.* Yonkers-on-Hudson, N. Y., World Bk. Co., 1927. 310 pp. $1.36.

Clarke, M. V. *Six Latin dialogues for junior high schools and Latin clubs.* Boston, Palmer Co., 1926. 16 pp. $.25.

Cook, L. B. *Experiments in writing; a high-school textbook in composition for the junior and senior years.* New York, Harcourt, Brace, 1927. 504 pp. $1.56.

Cornyn, J. H. *Cuentos Mejicanos.* Richmond, Va., Johnson Pub. Co., 1925. 219 pp. $1.28.

Dekker, Thomas. *The shoemakers holiday.* New York, Dutton, n.d. 157 pp. $.60.

Donaldson, A. M., and Manning, Sibylla. *Fundamentals of dress construction.* New York, Macmillan, 1926. 223 pp. $1.60.

D'Ooge, B. L., and Roehm, D. M. *Junior Latin lessons.* Boston, Ginn, 1927. Book two. 538 pp. $1.56.

Elson, H. W. *History of the United States of America.* New York, Macmillan, 1926. 996 pp. $2.80.

Fay, C. R. *Elements of economics; a textbook for secondary schools.* New York, Macmillan, 1926. 631 pp. $1.68.

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Gates, A. I. *The improvement of reading; a program of diagnostic and remedial methods.* New York, Macmillan, 1927. 440 pp. $2.00.

Goldsmith, Oliver. *She stoops to conquer.* New York, Dutton, n.d. 192 pp. $.60.

Goodyear, Frederick. *Printing and book crafts for schools.* New York, Stokes, n.d. 213 pp. $4.00.

Gray, M. D., and Jenkins, Thornton. *Latin for today; a first-year course.* Boston, Ginn, 1927. 503 pp. $1.40.

Harned, W. E. *Intermediate typewriting studies for second-year courses in typewriting.* Boston, Ginn, 1927. $1.36.

Heaton, Trevor. *The human body.* New York, Dutton, 1927. 250 pp. $3.00.

Herzberg, M. J. *Outline for the study of contemporary literature.* Boston, Palmer Co., 1927. 42 pp. $.20.

Jones, H. A. *Progressive lessons in machine shop practice.* New York Thomas Nelson & Sons, 1926. 172 pp. $2.00.

Keasey, M. A., and others. *Plane trigonometry with tables.* Philadelphia, Blakiston, 1927. 130 pp. $1.28.

Kirk, J. G., and Waesche, M. A. *Junior training for modern business.* Philadelphia, Winston, 1927. Teachers manual. 176 pp. $1.00.

Knight, W. E. *España y el nuevo mundo.* Richmond, Va., Johnson Pub. Co., 1927. $1.36.

Lazare, Jules. *Lectures faciles pour les commençants.* Boston, Ginn, 1927. 108 pp. $.56.

Lazarillo de Tormes. *La vida de Lazarillo de Tormes, y de sus fortunas y adversidades.* Ed. by H. C. Berkowitz and S. A. Wofsy. Richmond, Va., Johnson Pub. Co., 1927. 166 pp. $1.40.

McKinley, A. E., and others. *World history in the making.* New York, American Bk. Co., 1927. 742 pp. $1.92.

Martin, Gladys, and Martin, Donnis. *Fifty Latin verbs; their compounds and derivatives.* Boston, Palmer Co., 1927. 20 pp. $.30.

Melville, Herman. *The whaling story from Moby Dick.* New York, Dutton, n.d. 256 pp. $.60.

Mercier, L. J. A. *Junior French.* New York, Silver, Burdett, 1927. 376 pp. $1.68.

Modern essays of various types. Ed. by C. A. Cockayne. New York, Merrill, 1927. 391 pp. $.80.

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